

THE IRON AGE

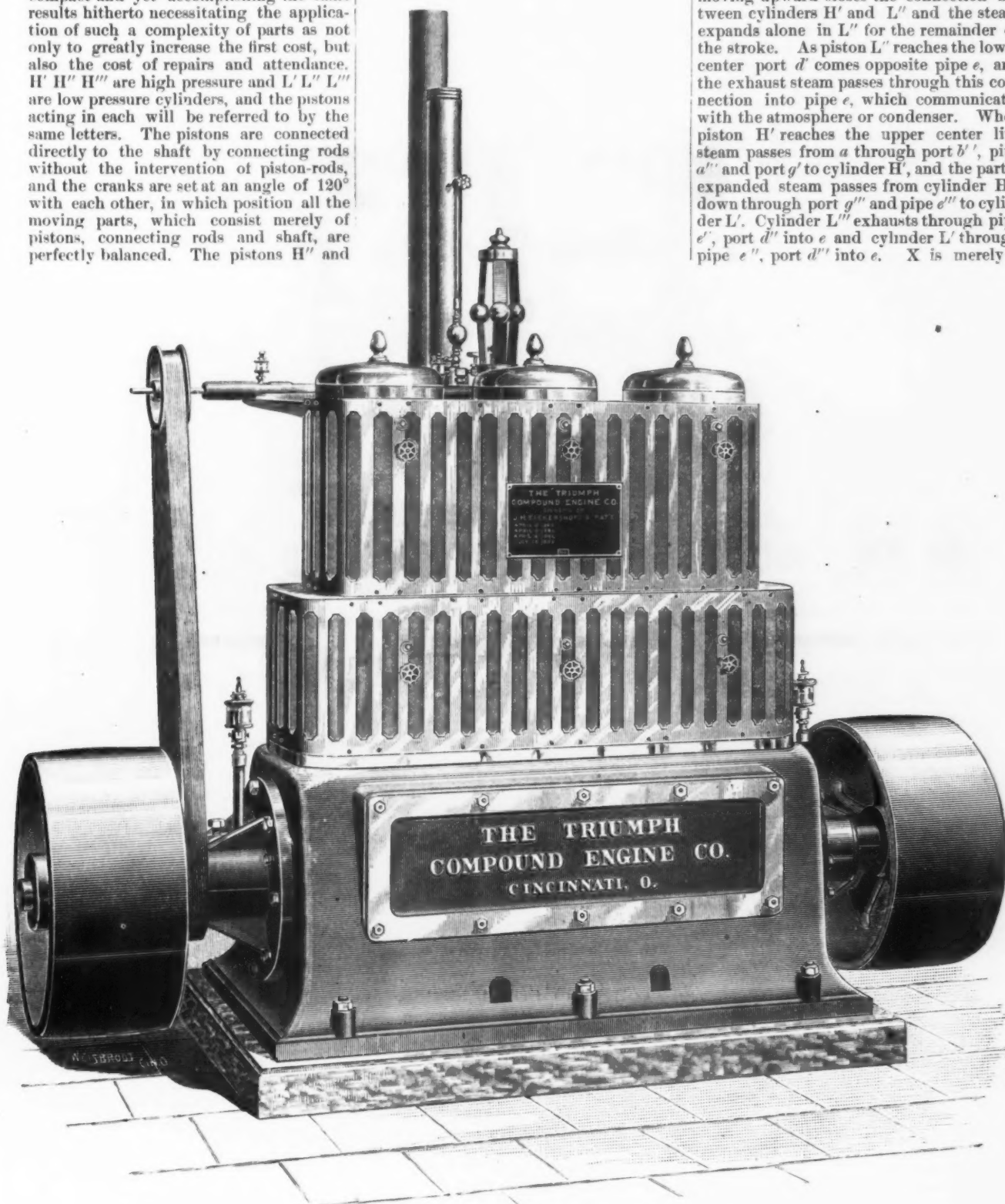
THURSDAY, FEBRUARY 13, 1890

Compound Steam Engine.

The accompanying cuts show a new valveless compound engine which, it is claimed, marks a revolution in the engine business, being remarkably simple and compact and yet accomplishing the same results hitherto necessitating the application of such a complexity of parts as not only to greatly increase the first cost, but also the cost of repairs and attendance. H' H'' H''' are high pressure and L' L'' L''' are low pressure cylinders, and the pistons acting in each will be referred to by the same letters. The pistons are connected directly to the shaft by connecting rods without the intervention of piston-rods, and the cranks are set at an angle of 120° with each other, in which position all the moving parts, which consist merely of pistons, connecting rods and shaft, are perfectly balanced. The pistons H'' and

port g'' to cylinder H'' , and at the same instant steam which has been partly expanded in cylinder H' passes down through port g' and pipe e' to cylinder L'' , thus admitting live and low pressure steam on one

cylinder until the lower edge of port g'' passes the upper edge of pipe e'' , at which point it passes to cylinder L''' . At the same moment live steam passes from a through port b'' , pipe a'' and port g''' to cylinder H''' . At this point also piston H' moving upward closes the connection between cylinders H' and L'' and the steam expands alone in L'' for the remainder of the stroke. As piston L' reaches the lower center port d' comes opposite pipe e , and the exhaust steam passes through this connection into pipe e , which communicates with the atmosphere or condenser. When piston H' reaches the upper center live steam passes from a through port b'' , pipe a'' and port g' to cylinder H' , and the partly expanded steam passes from cylinder H''' down through port g''' and pipe e''' to cylinder L' . Cylinder L''' exhausts through pipe e'' , port d'' into e and cylinder L' through pipe e' , port d''' into e . X is merely a



SINGLE-ACTING COMPOUND STEAM ENGINE.

L' are shown on the upper center, pistons H' and L' being 120° in advance and pistons H''' and L''' 120° in the rear.

In this position live steam is admitted from main steam-pipe, which is connected with the boiler through port b' , pipe a' and

set of pistons at the same moment. Under the action of the steam pistons H' and L'' move downward, live steam being admitted until the upper edge of port g'' passes the lower edge of the pipe a' at which point it is cut off and expands alone in this

live steam connection with the low-pressure cylinders for heating up and starting. Thus with the exception of the cut-off each set of pistons controls the steam in the cylinder next preceding in the order of rotation, and when acting as a valve is

at or near its maximum speed, while the pistons in the preceding cylinders are at or near their slowest speed. This simple expedient controls the steam in this engine in a manner unexcelled by any valve device.

All lubrication is perfectly automatic, consisting of a sight feed lubricator on the steam-pipe, a drop sight feed cup on each end bearing of the shaft and a mixture of oil and water in the crank case perfectly lubricating all parts within. The cylinders are cast in one piece and bored at the same time on a tool especially designed for the purpose, by which means they are made absolutely parallel and the danger of leaky joints avoided. The bear-

of antimony should be assessed with duty, under the provisions in T. L., 189, for "lead in pigs."

Shipping Lake Superior Ores.

The necessity for improving the St. Mary's Ship canal, in order to promote shipments of ore from Lake Superior formed the substance of arguments by Senator Gorman and others, last week, before the House Committee on Rivers and Harbors. According to statements made before the Senate Committee, the general public has very little conception of the enormous and rapidly increasing trade on the lakes. In

the Alleghenies for the first time a year ago. Last summer over 300,000 tons of it was landed at Buffalo and was sent over the Lehigh Valley and over other roads to the iron mills of Eastern Pennsylvania. By the further improvement of the waterways and better railroad and mining facilities it is expected that this ore will be brought into the Pennsylvania mills at a still lower rate, and as it is largely Bessemer ore the result in the future on the iron business in the North may be of great importance, enabling it better to compete with the southern mines and mills, and with the foreign ore which, owing to the difference in wages and the low rate of ocean freights, can now be landed along

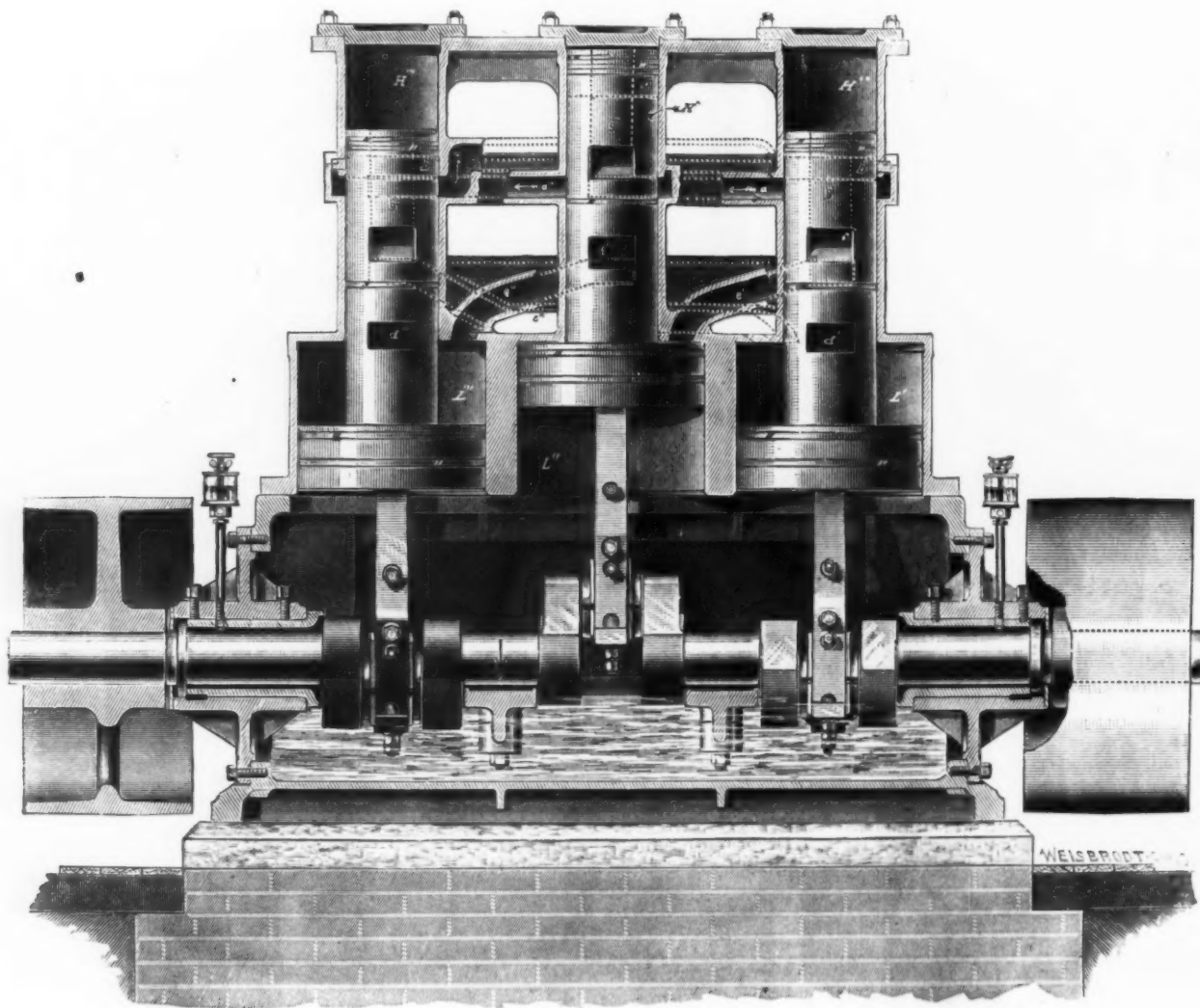


Fig. 2.—Vertical Longitudinal Section.

COMPOUND STEAM ENGINE.

ings for shaft are bored out after being bolted in place, insuring perfect alignment, and all wearing surfaces are exceptionally large, so that internal friction is reduced to a minimum. The only adjustments consist of two keys in the connecting rods which take up all the wear in both boxes. The pressure being always downward these adjustments are seldom necessary, and the engine will run indefinitely without stoppage and with but little attendance. This engine is built by the Triumph Compound Engine Company, Cincinnati, Ohio.

In a letter to the Collector of Customs, dated January 31, George C. Tichenor, Assistant Secretary of the Treasury, has decided that so-called type metal or antimonial lead containing less than 9 per cent.

1887 there were seventy-nine large ships launched for this lake trade; last year sixty-two, and forty-two more are now under contract to be completed in May. While there is a decrease in the number of vessels, there is a very large increase in the tonnage, owing to the increase in the size of the vessels. The average size of those being constructed is from 3500 to 4000 tons, and they are mostly steel vessels. This increase in the size of the ships engaging in the lake trade calls for improvement in the St. Mary's canal and other channels through which they pass. The effect of this on the lake trade is shown in the great decrease in freights. Ten years ago the average freight on a ton of ore from Marquette to Cleveland was \$3, but this last summer freights were reduced as low as \$1.05. The low rate on the lake enabled the mine operators to ship the ore east of

the eastern coast, duty paid, at a lower rate than the ore from the western mines.

The Philadelphia and Reading Railroad Company contracted with Nolan Bros. for the construction of 23 piers for a new bridge across the Susquehanna River at Harrisburg. The structure will be a mile long and 40 feet above the water. An elevated road through the city will form the bridge connection.

The Pennsylvania Railroad Company's officials have in contemplation the erection of an interesting monument near Bordentown, N. J., to designate the location of the first mile of railroad laid in New Jersey. A portion of the monument will be made of the original spikes and plates of the first section of the road, which have been carefully preserved for this purpose.

The Colors Produced During the Tempering of Steel.*

It has long been observed, and every steel worker knows, that when bright steel is heated in the air to certain definite temperatures, a series of colors can be obtained, beginning with a light straw and passing through a succession of brown and purple shades to a deep blue. These colors have attracted the attention of many observers and suggest questions of interest as to the causes and circumstances of their production and the physical and other problems therewith connected. In addition, however, to any other cause of interest these colors possess, they have been studied on account of their real and supposed importance in the arts. Every one must be familiar with the different shades of color which are given to steel pens, varying from a very light straw to a deep purple or blue. These various shades are commonly produced by heating the clean, bright pens, in their otherwise finished condition, to a suitable temperature in a revolving cylinder. When the desired color has been obtained the pens are immediately cooled by being turned quickly out on to a sieve or other cooling place, so that the color produced may not change by further heating. The colors of the pens met with in commerce are, however, not quite the same as those produced as above described, since the tints are

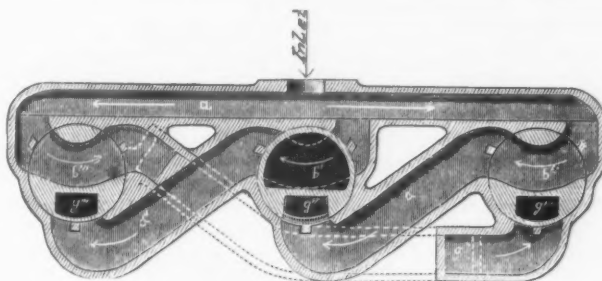


Fig. 4.—Sectional Plan through Live Steam Ports.

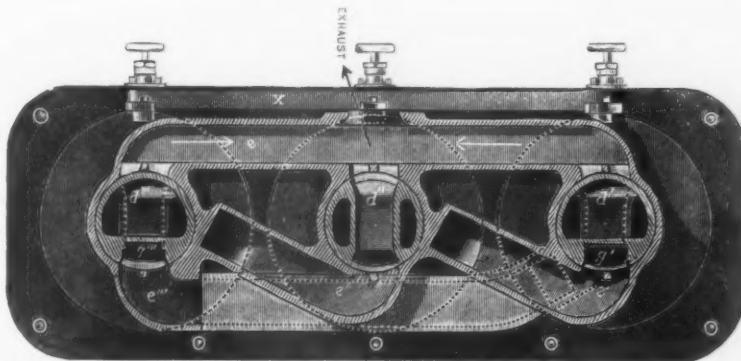


Fig. 5.—Sectional Plan through the Expansion Ports.

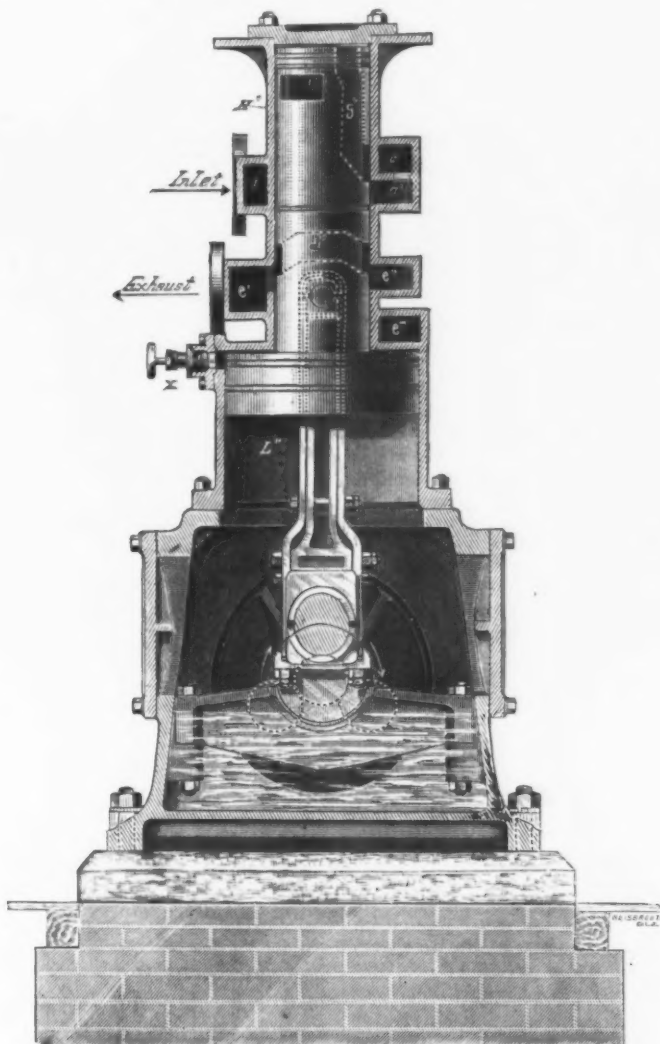


Fig. 3.—Vertical Cross-Section.

slightly altered by the lacquer which is used to prevent rusting. Another well-known application to these colors is in the

* Paper read by Mr. Thomas Turner, lecturer on metallurgy, Mason College, Birmingham, before the Birmingham Philosophical Society, June 13, 1889.

ordinary method of tempering steel, which is a very important, though in many cases an extremely delicate operation. After the steel has been hardened, say, in the form of a plain drill or chisel or other simple tool, the workman commonly cleans a portion of the surface of the steel and then

once more cautiously heats it until a certain desired color is obtained on the bright surface; the tool is then usually immediately cooled in water. It will be seen, therefore, that the formation of a particular color is assumed to correspond more or less nearly with a certain combination of hardness and tenacity which is required in the tool; and when it is remembered that usually the value of the tool is dependent to a very considerable extent on the temper which is imparted to it, and that the workman judges of this temper by the color of the surface, it will be seen that the study of the properties of these colors is of great importance to thousands of workshops in this country. Further, the whole range of temperature used in tempering steel generally extends only from about 220° to 320° C. or thereabouts—that is, only about 100° C. (though we have good reason to believe that this range is capable of extension); it will be seen, therefore, that it must involve very considerable experience to successfully temper a piece of steel when the operator is obliged to work in the manner above described.

Thus, within the range of only 100° C., we have compressed the points which are necessary for the proper treatment of a knife edge and a cold chisel, a razor and a spring, a steel engraver's tool and a saw, a lancet and a hatchet, tools as opposite as possible in properties and uses, and each and all of which would be entirely unfitted for their purpose if treated improperly during tempering. It is no exaggeration to say that a difference of only 10° C. would often exert a considerable influence on the usefulness of a tool, and yet in most cases the workman can only judge of the temperature employed by the color he observes.

The best and most complete color-tempering scale with which I am acquainted was published in the form of a colored diagram with the Report of the United States Chief of Ordnance, 1885, page 204. Most writers who touch on this subject treat it in a stereotyped manner, stating that when bright steel is heated to a certain temperature such and such a color is produced, and this is suitable for lancets, chisels, springs or other articles, as the case may be. It is therefore tacitly assumed, though not perhaps actually stated, that a particular color corresponds to a certain temper and is invariably produced at a particular temperature. In fact, the

three things—color, temper and temper-ature—might, so far as the text books are concerned, be closely and forever united.

The cause of the production of these colors is now universally, I believe, acknowledged to be the formation of thin films of oxide on the surface of the metal when it is heated in presence of air. Even this question was at one time in dispute, such men as Davy (*Chemical Phil.*, p. 390, and Thomson (*Chemistry*, vol. 1, p. 224) taking the opposite view. But Davy afterward showed (*Thomson's Annals*, 1813, vol. 1, p. 131) that steel might be heated in a neutral gas, such as hydrogen or nitrogen, without being colored on its surface, and that steel remained colorless when heated under the surface of oil or of mercury.* I have frequently heated bright strips of polished steel for hours under the surface of mercury or oil without discoloration, while they would have been instantly colored at the temperature used if heated in contact with air. I think, further, that there can be little doubt that the oxide so produced is practically transparent, first, because the sequence of colors is what would be expected in films of a transparent substance when the thickness of the films gradually increases; also because of observations on the reflected light, the color of which varies somewhat at different angles, but chiefly because it is found that on increasing the temperature a little above the point necessary to produce a dark blue the color gradually disappears (though doubtless oxidation proceeds more rapidly), and the surface, though covered with more oxide, becomes almost colorless again.

When it is granted that the colors we are considering are the result of oxidation it would at once appear probable that the nature of the surface to be heated, its freedom from dirt and grease and the length of time during which it is heated, would all exert a considerable influence on the shade produced. It would also appear probable that the amount of carbon present in the metal and the condition in which the carbon existed would have comparatively little influence. Hitherto my experiments have been chiefly directed to the study of these simple and, as they appear, almost self-evident conclusions.

Heating has usually been performed in a large air oven inside of which, about 2 inches from the bottom, was an iron tray supported on fire-bricks and filled with sand to the depth of about an inch, a small space being left all round the tray so as to prevent contact with the sides of the oven. Resting on the surface of the sand, but not touching the edges of the tray, was a plate of copper on which were placed the strips of steel it was desired to heat. The object of this arrangement was to prevent irregular heating from below and to give as much uniformity as possible. Passing through the center of the copper plate and partly covered by the sand was the thermometer used; and as even with these precautions it was not found possible to get perfect uniformity, a considerable number of strips was operated upon at one time and about four removed from different parts of the plate, when an observation was made. I am indebted to Messrs. Perry & Co. (late Sir Josiah Mason) for specimens of bright crucible pen-steel both in the soft and in the hardened condition, while Mr. G. H. Strick, of Brynamman, kindly supplied me with samples of bright wrought-iron. It is, of course, necessary that for such experiments the steel to be used should be clean and bright. A rough surface does not give nearly the same brilliancy of color as is noticed when the metal is carefully polished, though the shade is pretty nearly the same in both cases. The

presence of dirt usually causes irregular coloring, producing bands or spots of color different to the rest of the surface. Naturally, too, some kinds of dirt appear to assist oxidation, though the shade is less brilliant, while other kinds of dirt exert a protective influence. The brightest shades are produced with perfectly clean and polished* surfaces, and few people are aware of the gorgeousness of the shades of purple and blue which can be produced on a large surface with proper conditions.

In connection with the supposed relationship between color and temper, I have taken strips of bright steel, hardened and unhardened, and also bright wrought-iron, and heated them as above described at various temperatures, for definite periods, and find that practically each of these three varieties of iron gives the same colors in the same time. The only difference I have been able to perceive is that the hardened steel gives the brightest color, and the wrought iron the least brilliant. This difference in brilliancy is, no doubt, due to the fact that the surface was more perfect in the hardened-steel specimens, which had been carefully cleaned by rotation with sand in barrels for a lengthened period. The fact that in each of the three classes the shade produced under similar circumstances is identical, shows at once that the color on a steel tool is no indication whatever as to the contents of carbon or the temper of the steel. As bearing on this aspect of the question it may be mentioned that Bousfield patented (1866, No. 2810) a method of bluing the surface of sheet iron. After the sheets had been properly cleansed they were heated in an air-tight flask for a good many hours at 700° F., care being taken that no two sheets were in contact with each other. Probably a lower temperature, and a shorter time, with free access of air, would produce a similar result. I notice, too, that in some cases cast iron is colored in a similar manner, and this fact confirms the above conclusions.*

From the very beginning of my experiments I have been struck with the fact that time has a most important influence in developing these colors. From a study of ordinary text-books one might readily conclude that to produce a light straw color about 221° C. is necessary, while about 320° C. is required to produce a blue color. Such a conclusion would, however, be quite erroneous, for it is easy by heating the specimens for a comparatively lengthened period to produce a blue color at a temperature below that which is usually regarded as necessary to give a straw color, or over 100° below that which is generally accepted as producing a blue. In the same way a straw color can be produced in a few minutes fully 50° below 221° C., which is the generally accepted temperature. It will be found, however, that as we pass from shade to shade up the series, each color requires a longer interval for its production at a given temperature than the one which preceded it. Thus, at a given temperature, we may pass from very light straw to straw, a well-marked change in a few minutes, while at the same temperature it may require almost as many hours to pass from purple to blue. Further, in starting with low temperatures, the intervals of time between the various shades are greater and become very considerable indeed for the deeper shades. For example, a purple can be produced at 250° in a few minutes which would require an hour at 220°, or about 12 hours at 170°, though the ultimate result would be the same in each case.

* Dr. Percy has given details of the methods used to obtain the bright gray-black coating on Russian sheet iron ("Manufacture of Russian Sheet Iron, 1871"). The color in this instance is partly due to carbonaceous matter.

On the other hand, it can be shown that with a deficiency of oxygen, iron or steel may be heated far above the temperatures previously mentioned without producing the usual succession of colors. Thus, in annealing sheet iron in the manufacture of tin plates, a number of sheets are heated to redness for some hours in an iron box from which the air is excluded as far as possible. On removing the sheets when cold they are found to be straw-colored or brown in the center over perhaps two-thirds of their area. Surrounding this center portion, passing outward in order, are found purple, blue, light blue, blue green and nearly colorless, depending on the amount of oxidation, though the sheets themselves have been exposed for a considerable time to a red heat. Bousfield's patent, above mentioned, is another example of the same kind. Details of a few of my own experiments, undertaken to try and determine the interval between definite shades, may serve to illustrate these facts. Thus:

Total time of heating at 221°-227° C.	Interval between samples.	Color.
Min-utes.	Min-utes.	
5	7	Dark straw.
12	9	Brown.
21	11	Brown, with purple.
35	11	Nearly all purple.
45	13	Purple, with some blue spots.
59	15	Very similar.
77	15	Nearly all blue.
95	19	Very similar.
117	21	Deep blue.
140	23	Blue, with slight tinge of green.

It will be seen on examination of the specimens shown that several of the above colors are "bastards"—i. e., transition of colors—and that, although the last interval (23 minutes) is more than four times as long as the first (five minutes), still the early intervals are too long and the later ones too short. Another experiment gave:

Total time of heating at 220°-227° C.	Interval between samples.	Color.
Min-utes.	Min-utes.	
1	3	Very light straw.
4	3	Light straw.
9	5	Straw.
16	7	Brown.
25	9	Brown, with purple.
36	11	Brown and purple, about equal.
49	13	Purple, with some brown.
64	15	Purple, with blue.
81	17	Nearly all blue.
100	19	Blue.

In this experiment, though the time of heating varied as the squares of the numbers from one to ten, still the intervals were too short in the later samples and transition colors were obtained. The earlier samples also were not so definite as might be desired, though it would be difficult to express the slight variations in words. The following was a more successful experiment:

Total time of heating at 220°-227° C.	Interval between samples.	Color.
Min-utes.	Min-utes.	
4	4	Very light straw.
16	8	Straw.
32	16	Dark straw.
64	32	Brown.
128	64	Brown, with purple.
256	128	Purple.
		Dark blue.
		Greenish blue.

* Professor Roberts-Austen has also shown that steel is not colored when heated in vacuo.

The three series of steel test pieces as above are exhibited in the room, and it is evident to all that the last of the three experiments gave far the best results, as judged by the distinctness of the shades produced. Hence at the temperature used (220° to 227° C., corresponding closely with 221° , commonly accepted as giving a straw color), the time required to pass from one distinct shade or color to the next increases approximately in geometrical progression. Dr. Poynting has suggested that at the temperatures used in my experiments the film of oxide first formed may act as a protection to the surface of the metal, and that the rate at which the thickness of the film increases may be represented by a logarithmic curve. I do not venture to suggest that a similar rule would hold good for all temperatures; of that I have no evidence; but this is certain—that at low temperatures, such as, say, 150° , the various colors can be produced, but it requires very prolonged heating in order to obtain the blue shades. On the other hand, the lighter colors can be produced at a high temperature, but require very little time for their development. I have not attempted to determine the lowest temperature at which these colors can be produced, and should imagine it would be difficult to do so accurately. I have, however, succeeded very well at 150° to 160° C., and do not doubt that with sufficient time a still lower temperature would suffice.

Though the foregoing observations prove that the color developed is dependent as much upon time as upon temperature, and that the color is independent alike of the amount and condition of the carbon present, so long as the surfaces and other conditions are alike, still these observations merely suggest another and more important question—namely, how far the temper of the steel may be affected and its properties changed by long continued heating at a temperature below that which is generally employed for tempering. Hitherto I have not been able to obtain quantitative results in this connection owing to the fact that steel strips, even when carefully hardened, not only differ in the various pieces, though cut off the same sheet and treated in the same manner, but even the same strip will very commonly differ in hardness on the two sides, and not unfrequently, even in a strip of only some 3 inches in length, one side of the strip will be different at each end, while the middle will not agree with either. Hence some more satisfactory method of experiment is required, but in the meantime I have satisfied myself that hardened steel strips, if heated for some hours at 220° C., are distinctly softer than similar strips which have been heated for a shorter time, and that though a few minutes at 220° produces a distinct effect, the interval has to be considerably increased from time to time in order to produce further and further appreciable softening of steel. I am informed that the experience of steel-pen manufacturers lends support to the above opinions, and I may venture in conclusion to refer to other observations in the same direction. Brande (*Chemistry*, 1848, vol. i, p. 759) gives the following interesting details in reference to the preparation of knife edges for a pendulum used by Captain Kater (*Phil. Transactions*, 1818, p. 38), the details of which preparation were not given in Captain Kater's original paper. Brande states that the knife edges "were forged by Mr. Stodart from a piece of fine wootz; they were carefully hardened and tempered in the bath at 430° F.; on trial they were found too soft. They were a second time hardened and then heated to 212° . The intention was to increase the heat from that point, trying the temper at the advance of about every 10° . In the present instance this was not necessary, the

heat of boiling water proving to be the exact point at which the knife edges were admirably tempered." "It is highly probable," Brande continues, "that steel for many uses may be sufficiently tempered in a range so extensive as from 212° to 430° (100° to 221° C.). But this is not the temperature only, but also the time during which the steel is exposed to it, which influences its hardness or temper." As confirming the view that steel may be tempered at a lower temperature than is usually supposed, there are also the experiments of Professor Langley (*Proc. Inst. M.E.*, 1882, page 148), who showed that the density of steel was distinctly reduced—(i. e., the steel was hardened) by cooling rapidly from the boiling point of an alkaline solution used for removing the scale from the specimens examined. So far as my observations have gone, I believe—

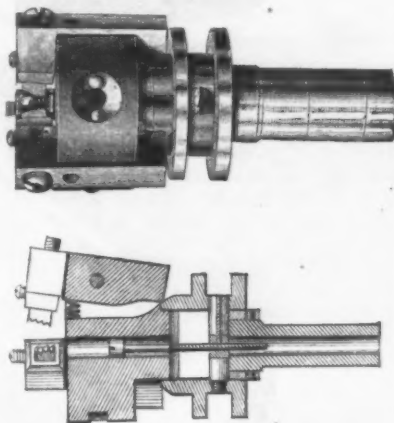
1. In the words of Brande: "It is not the temperature only, but also the time during which the steel is exposed to it, which influences its hardness or temper."

2. High carbon steels are more sensitive to the effects of comparatively low temperatures than are steels containing less carbon.

3. The colors observed in tempering steel can be produced by suitably varying the conditions, at temperatures far either above or below those usually accepted as necessary to produce a particular shade; the colors can be produced alike with hardened or with unhardened steel, and with wrought iron or cast iron as well as with steel. They are, therefore, independent of the amount or condition of the carbon present in the steel.

Screw-Cutting Chuck.

The patent screw-cutting chuck here illustrated is known as the Mischke, and is placed on the market by the Conant Mfg.



Screw Cutting Chuck.

Company of 162 West Twenty-seventh street, New-York. The principal feature in the construction of the chuck is the hinged jaws, which are so arranged that the cutting dies automatically spring back and away from the work, so that there is no reverse motion necessary to relieve the tool. The time saved by this construction is obvious, since as the release is practically instantaneous, all time usually lost in reversing and unscrewing the cutter is saved. The method of mounting each jaw carrying a part of the cutter is shown in the sectional view. By means of a pivot placed about in the center it is hinged in a recess formed in the body of the chuck, and its forward or cutting end is pressed outward or away from the center by means of a spring arranged as shown. On the rear end of the chuck is a sliding collar beveled at its extreme forward portion and slightly tapered at its

remaining part. By means of a set screw extending longitudinally through the body of the chuck the distance traveled by the collar can be adjusted to govern the distance the rear ends of the jaws will mount the tapered portion. In this way the opening of the dies can be adjusted to a slight extent without resetting them. Extending in a direction parallel with the axis of the chuck and secured at any desired point in the collar by a radial set screw, is a screw rod, against the forward end of which, the work being threaded, strikes, pushes the collar back, permits the rear ends of the jaws to slide off the beveled portion of the collar and thereby release the dies, when the work can be instantly withdrawn. It is evident that this gauge-bar can be set at any desired distance from the jaws and the length of the thread varied to suit requirements. When necessary this gauge-bar can be entirely removed and endless screws cut. The forward motion of the collar to bring the dies to their cutting position can be accomplished by hand or can be arranged to work automatically.

The shank of the chuck is made cylindrical in order to be held in an ordinary chuck, or can be tapered as may be desired. Each cutting die is placed in the jaw in an opening which just fits it, and at the rear end of which is a set screw, by means of which the jaws can be adjusted to and from the center in order to cut threads of varying diameters. In the face of each jaw is a set screw, the object of which is merely to keep the cutting die in place. These chucks are made in two standard sizes, threading from $\frac{1}{8}$ to $\frac{3}{4}$, and from $\frac{3}{4}$ to $\frac{3}{2}$. Special dies are also made for pipe and gas-fitters' work intended for the severest use. It is evident that the life of the dies—any single one of which can be furnished when desired—is considerably extended as no wear takes place except when they are cutting.

The Best Furnace Record Ever Made.

The *Bulletin* of the American Iron and Steel Association learns from James Gayley, superintendent of furnaces, at the Edgar Thomson Steel Works, at Braddock, Pa., that Furnace F, which went out of blast on August 7, 1889, was relined and blown in again on September 25. Some slight changes were made in the furnace lines with a view to obtaining greater economy in fuel, but otherwise the furnace is practically the same as before. The results so far obtained have been a great improvement over the former run. Commencing with the month of November the record of output and fuel consumption has been as follows:

	Bessemer iron gross tons.	Pounds coke per gross ton iron produced.
November.....	9,097	1,897
December.....	10,603	1,756
January.....	10,536	1,737
Best week's output.....	2,462	1,702
Best day's output.....	457

The best record obtained during the previous blast was as follows:

	Bessemer iron gross tons.	Pounds coke per gross ton iron produced.
Month.....	8,478	1,994
Week.....	2,161
Day.....	419

These records certainly warrant the erection of the three brooms and the hoisting of the American flag which the men have enthusiastically raised at the tunnel-head of the furnace.

The threatened trouble between the coke operators of the Connellsville, Pa., region and the workers has been amicably settled with the probable result of an advance of about 15 per cent. in the cost of the production of coke.

Squaring Shear.

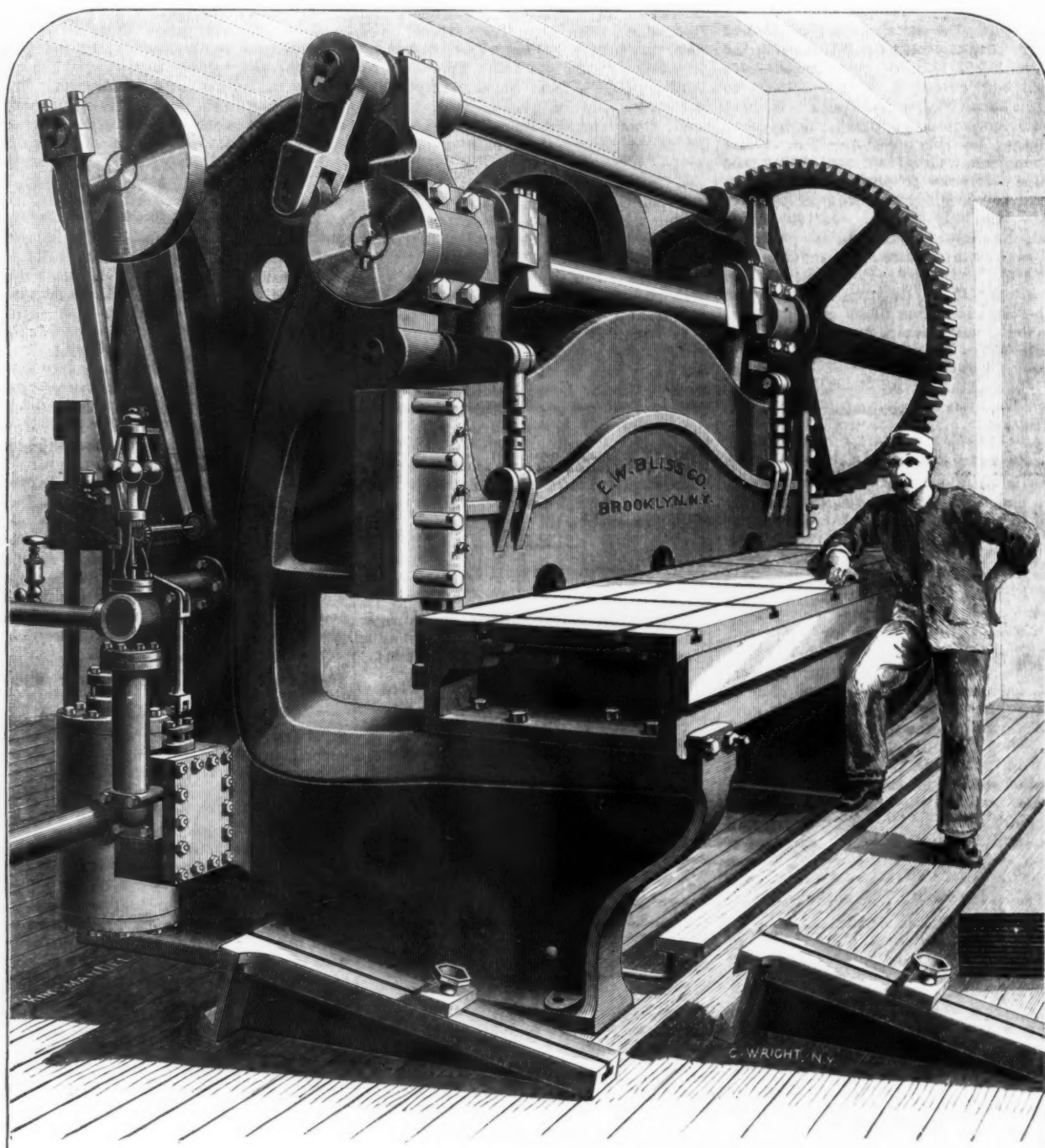
Of recent years the demand of the trade for sheet iron to be trimmed accurately to size has induced the sheet mills to add to their plant Squaring and Trimming Machines, which supersede for this purpose the old-fashioned and inaccurate alligator shear. The cut here presented represents the most recent design of the Standard Trimming and Squaring Shear, built by

lengthwise through the center. In order to hold the pack securely in place while being sheared, a clamping-bar is placed directly in front of the cutter-bar. This descends automatically in advance of the latter, and remains firmly pressing against the work until the cut is completed, after which it withdraws in order to allow the work to be removed.

The main-shaft is of billet steel, $6\frac{1}{2}$ inches in diameter, with the two cranks for ope-

ranged with suitable adjusting screws to regulate the pressure upon the work.

The machine is driven either by belt from line shaft, or as here shown, by an independent engine attached to the housing. The engine is of the plain slide-valve pattern, with throttle governor, and is designed with special view to simplicity and compactness, so as not to require much attention, and with strength and durability of parts to obviate undue repairs, rather



SQUARING SHEAR, BUILT BY E. W. BLISS CO.

E. W. Bliss Company for the Standard Iron Company, and for the Wheeling Iron and Nail Company.

This machine will cut $\frac{3}{4}$ inch plate or packs of sheet up to that thickness, the length of cut being 10 feet 4 inches. The housings, as will be seen from the cut, are so arranged that a sheet or pack of greater length may be trimmed by moving it along and taking successive cuts; and the gauges are so arranged that the cut so continued will be true and in line with the first. The "gap," or distance back from the cutting edge to the housing, is sufficient to allow of a plate or pack 36 inches wide, being sheared

rating the cutter-bar forged and slotted out. It is driven by a 5 foot gear, to which a powerful clutch is attached, and which is operated from a treadle. The gear revolves continuously and freely upon the shaft until the treadle is depressed by the operator, which, being done, the shaft makes one revolution, performing its work, and stops, with the cranks at their upper position. The clamping device is operated from a cam on the end of the main-shafts which imparts motion to a rock-shaft across the top of the machine. Two lever on this rock-shaft give motion to the clamping-bar, by means of two connections ar-

than to great economy of steam. The cylinder is 9 inch bore x 15 inch stroke, with the valve set to cut off at about $\frac{1}{4}$ of the stroke. The total weight of the machine is 30,000 lbs.

The new tug International, just finished at Neafie & Levy's, for the Red Star Line of tugs of Peter Wright & Sons, is without doubt the finest tug afloat. She is of iron, 140 feet long, 26 feet beam, and 17 feet depth of hold, registered tonnage being 400 tons. The deck-house is also of iron, 75 feet long. The machinery consists of a triple-expansion engine of

about 700 horse power, with cylinders 16, 24 and 41 inches diameter, by 30 inches stroke. Steam is supplied at 160 pounds pressure, by two boilers of steel, each 10 feet 3 inches diameter by 11 feet long, having corrugated furnaces. Her cost complete is about \$80,000. Charles Hillman & Co., of this city, will build the engines and boiler. She is intended for service on the Delaware River and Bay.

The New England Petition.

The following is the text of the petition of which so much is made by certain newspapers:

To the Senators and Representatives in Congress of the New England States:

The undersigned, proprietors or managers of iron-working establishments in New England, being members of all political parties; and believing that, in the adjustment of the tariff, a careful regard should be had to the rights and interests of all sections, and of all the people; that the local interests of each section should be carefully watched by its delegates in Congress, and that in order to be fully informed, such delegates must necessarily depend largely upon information furnished by their constituents; do hereby respectfully unite in calling your attention to the condition of the iron and steel-working interests in New England, and to the effect of this condition upon the general interests of this section of our common country, as fully set forth in a statement prefixed hereto.

And, in view of the approaching revision of the tariff laws, we further unite in the request that you will insist upon the incorporation of the following provisions, in any revised tariff law that shall be enacted.

1. That iron ore, coal and coke shall be put upon the free list, as they were before the war.
2. That the duty upon pig iron and scrap iron and scrap steel which prevailed immediately before the war, be restored; to wit, a duty of 24 per cent. ad valorem.

This petition is signed by the following firms and individuals:

- Tremont Nail Company, Horace P. Tobey, treasurer, nail and steel manufacturers, &c., West Wareham, Mass.
- Palmer Wire Mfg. Company, Henry P. Holden, treasurer; H. L. Holden president, wire drawers, Palmer, Mass.
- Thos. Goggin, iron and steel manufacturer, Boston, Mass.
- Wm. E. Coffin, iron manufacturer, Boston, Mass.
- Bay State Iron Company, John H. Reed, treasurer, iron manufacturing, Boston, Mass.
- South Boston Iron Works, W. P. Hunt, president, iron foundry, Boston, Mass.
- Daniel Hanson, manufacturer of skiving machines, North Weare, N. H.
- The Colts Fire-Arms Machine Company, by Jno. H. Hall, general manager, machinery, fire-arms, &c., Hartford, Conn.
- Rhode Island Tool Company, Wm. B. Dart, treasurer, nuts, bolts, drop forgings, &c., Providence, R. I.
- Wm. H. Smiley, Tack manufacturer, Haverhill, Mass.
- Clark & Dow, tack and nail manufacturers, Haverhill, Mass.
- Bartlett & Perkins, nail manufacturers, North Middleboro', Mass.
- Nahum Stetson, iron manufacturer, Bridgewater, Mass.
- J. A. Northrop, foundry and machine works, New Milford, Conn.
- Dighton Furnace Company, Jas. H. Coddington, treasurer, stove foundry, Taunton, Mass.
- E. Phillips & Sons, tack manufacturers, South Hanover, Mass.
- Z. Talbot, tack manufacturer, Holliston, Mass.
- Holliston Mills, machinery, Holliston, Mass.
- Peter Joyce, iron foundry, Brattleboro', Vt.
- H. B. Beach & Son, boiler manufacturers, Hartford, Conn.
- Richard Sugden, wire manufacturer, Spencer, Mass.
- Dunbar, Hobart & Co., tack manufacturers, Whitman, Mass.
- David B. Gurney, tack manufacturer, Whitman, Mass.
- D. A. Gurney & Co., steel shanks, Whitman, Mass.
- Jenkins Bros. & Co., steel shanks, Whitman, Mass.
- Cambridge Rolling Mills, iron manufacturers, Cambridgeport, Mass.
- New England Butt Company, foundry, machinery and hardware, Providence, R. I.
- Beach & Co., iron manufacturers, Hartford, Conn.
- Cobb & Drew, nail, tack and rivet manufacturers, Plymouth, Mass.
- Armington & Sims Engine Company, Pardon Armington, Treasurer, manufacturers of steam engines, Providence, R. I.
- Chas. M. Beach, iron manufacturer, Hartford, Conn.
- H. C. & W. S. Cole, tack manufacturers, Kingston, Mass.
- French, Hall & Co., tack manufacturers, Rockland, Mass.
- Henry Perkins, foundry and machine shop, Bridgewater, Mass.
- Perkins Bros., wire nail manufacturers, Bridgewater, Mass.
- Tyler Steel Tube Company, Wm. P. Tyler, President, steel tubes, &c., Boston, Mass.
- Florence Tack Company, G. W. Bond, Treasurer, tack and small nail manufacturers, Northampton, Mass.
- East Bridgewater Iron Company, iron manufacturers, East Bridgewater, Mass.
- Boston Forge Company, Jas. Smith, Treasurer, Railroad and steam marine works, &c., East Boston, Mass.
- W. Osborne & Co., nail manufacturers, Lakeville, Mass.
- B. Schlesinger, iron manufacturer, Boston, Mass.
- The Pratt & Cady Company, by Ernest Cady, treasurer, manufacturers of iron and brass, Hartford, Conn.
- Manchester Locomotive Works, Aretus Blood, manager, locomotives, Manchester, N. H.
- Nashua Iron and Steel Company, Aretus Blood, treasurer, manufacturers of all kinds of iron and steel, Nashua, N. H.
- The Cushman Chuck Company, by E. L. Cushman, secretary and treasurer, manufacturers of chucks, &c., Hartford, Conn.
- Bradford Joint Company, bedstead fastenings, Plymouth, Mass.
- Brainard Milling Machine Company, A. H. Brainard, general superintendent, machine tools, Hyde Park, Mass.
- John T. Robinson & Co., fine machinery, Hyde Park, Mass.
- New Home Sewing Machine Company, J. W. Wheeler, treasurer, sewing machines, Orange, Mass.
- Joel Knapp, machinist, Lowell, Mass.
- The New Haven Rolling Mill Company, iron manufacturers, &c., New Haven, Conn.
- Alfred Morrill & Co., machinists and blacksmiths, Cambridgeport, Mass.
- Wm. Campbell & Co., Cambridge Boiler Works, Cambridgeport, Mass.
- Augustus Swift, iron founder, New Bedford, Mass.
- Bowker & Tripp, machinists, New Bedford, Mass.
- Luscomb & Corey, machinists, New Bedford, Mass.
- Brownell, Ashley & Co., carriage manufacturers, New Bedford, Mass.
- The Mallory Wheeler Company, lock manufacturers, New Haven, Conn.
- Humphrey Machine Company, founders and machinists, Keene, N. H.
- Walter Aiken, hosiery and machine builder, Franklin, N. H.
- Thos. W. Keely, Treas., Nashua Co-operative Iron Foundry Company, Nashua, N. H.
- Rollins Engine Company, steam-engines, Nashua, N. H.
- The American Tool and Machine Company, iron foundry and general machinery, Boston and Hyde Park, Mass.
- J. M. Watson, special machinery, Boston, Mass.
- Moore & Wyman, elevators and machinery, Boston, Mass.
- Jos. F. Carroll, Machinist, Boston, Mass.
- Jas. S. Newell & Co., press and machinery manufacturers, Boston, Mass.
- C. H. Hutchinson, foundry and machine works, Manchester, N. H.
- Harrison Soule, iron founder, Rochester, N. H.
- John A. White, wood-working machinery, Concord, N. H.
- John P. Smith, machinist, Exeter, N. H.
- Wm. P. Ford & Co., iron founders, Concord, N. H.
- Danl. Kidder, machinist, North Groton, N. H.
- Washburn & Moen Mfg. Company, steel works and wire mills, Worcester, Mass.
- American Twist Drill Co., machinery and tools, Laconia, N. H.
- George H. Whitney, manufacturer machinery and turbine water wheels, Nashua, N. H.
- J. R. Holman, machinery, Hinsdale, N. H.
- G. W. & C. A. Lane, manufacturers of mills and elevators, Exeter, N. H.
- Edward S. Taber, machinists' tools, New Bedford, Mass.
- The New Haven Wire Company, manufacturers of iron and steel wire, New Haven, Conn.
- Rodney Hunt Machine Company, E. N. Harris, treasurer, machinists and iron founders, Orange, Mass.
- Sargent & Co., hardware manufacturers, New Haven, Conn.
- Keene Mfg. Company, skate manufacturers, Keene, N. H.
- Chase Turbine Mfg. Company, L. Kilburn, treasurer, machinery and iron foundry, Keene, Mass.
- Samuel B. Locke & Co., iron foundry, Somerville, Mass.
- Cunningham Iron Works Company, boiler manufacturers, Charlestown, Mass.
- Household Sewing Machine Company, Geo. H. Dart, treasurer, sewing machines, Providence, R. I.
- Sibley Scythe Company, manufacturers of scythes and hoes, North Newport, N. H.
- A. E. Tenney Mfg. Company, manufacturers of machinery, Pawtucket, R. I.
- Geo. W. Payne & Co., manufacturers of machinery, Pawtucket, R. I.
- J. S. White, manufacturer of machinery, Pawtucket, R. I.
- J. C. Potter, president, manufacturer of machinery, Pawtucket, R. I.
- McWilliams Mfg. Company, Jno. McWilliams president, machinery, Providence, R. I.
- Allen Fire Department Supply Company, R. J. Gilmore, manager, machinery, Providence, R. I.
- Mechanics' Iron Foundry Company, J. A. Caldwell, treasurer, iron founders, Boston, Mass.
- Globe Nail Company, horseshoe nails, Boston, Mass.
- F. H. Woodward, manufacturer of hardware, Hill, N. H.
- W. H. Haskell Company, D. A. Abbott, agent, bolts, screws, &c., Pawtucket, R. I.
- Corliss Steam Engine Company, Wm. M. Cowan, treasurer, engine builders, Providence, R. I.
- Aretas Blood, president, horseshoe nails, Boston, Mass.
- Edw. Kendall & Sons, Charles River Iron Works, Cambridgeport, Mass.
- Henry M. Bird, Broadway Iron Foundry, Cambridgeport, Mass.
- Miller & Shaw, machinists and blacksmiths, Cambridgeport, Mass.
- Walworth O. Barbour & Co., iron founders, Cambridgeport, Mass.
- A. B. Phillips & Co., machinists, Whitman, Mass.
- Chas. T. Stetson, machine shop, Hanover, Mass.
- American Screw Company, Edwin G. Angell, President, screws, tire and stove bolts, rivets, wire nails, &c., Providence, R. I.
- Emerson Edge Tool Company, manufacturers, scythes, axes, straw cutters, &c., East Lebanon, N. H.
- James G. English, iron manufacturer, New Haven, Conn.
- Albert Field Tack Company, N. B. Deane, Treasurer, tacks, nails, shoe and wire nails, &c., Taunton, Mass.
- Norway Steel and Iron Company, Albert Geiger, Treasurer, iron and steel manufacturers, Boston, Mass.
- Taunton Tack Company, Thos. J. Lothrop, Treasurer, tack manufacturers, &c., Taunton, Mass.
- Brown & Sharpe Mfg. Company, machinists, Providence, R. I.
- The Yale Safe and Iron Company, Safes, &c., New Haven, Conn.
- Franconia Steel and Iron Works, Jas. C. Warr, Proprietor, steel and iron manufacturers, Wareham, Mass.
- Somerville Spike Works, Sylvester & Co., Proprietors, spike manufacturers, Somerville, Mass.
- Howard Foundry Company, Wm. A. Nye, Proprietor, iron foundry, Bournedale, Mass.
- Fairhaven Iron Works, L. S. Judd, Proprietor, iron foundry and machine shop, Fairhaven, Mass.
- New Bedford Iron Foundry, Edmund Grinnell, Proprietor, iron foundry, New Bedford, Mass.
- Oliver Ames, shovel manufacturer, North Easton, Mass.
- Ellis Foundry Company, Peleg McFarlin, treasurer, stove works, South Carver, Mass.
- R. H. Brown & Co., forgings and tools, New Haven, Conn.
- The D. Frisbie Company, elevators, New Haven, Conn.
- Rhode Island Locomotive Works, locomotive works, Providence, R. I.
- Highland Foundry Company, T. W. Elliott, treasurer, stove works, Boston Highlands, Mass.
- Magee Furnace Company, Albert T. Parlin, treasurer, stove works and furnaces, Boston, Mass.
- Wareham Nail Company, Edgar Robinson, proprietor, nail manufacturers, South Wareham, Mass.
- M. Seward & Son, carriage hardware manufacturers, New Haven, Conn.
- Reynolds & Son, screw bolts, &c., New Haven, Conn.
- Biddeford Stove Foundry, Geo. W. McFadden, treasurer, stove manufacturers, Biddeford, Maine.
- Portland Stove Foundry, F. M. Lawrence, treasurer, stove manufacturers, Portland, Maine.
- F. S. Perkins, machinist, Lowell, Mass.

Eugene C. Le Baron, iron foundry, Middleborough, Mass.
 The Brown Cotton Gin Company, manufacturers of cotton gins, New London, Conn.
 E. O. Baldwin, millwright, North Stratford, N. H.
 Cole & Nichols, iron foundry, Lowell, Mass.
 Taunton Locomotive Works, Taunton, Mass.
 A. L. Smith, iron foundry, Lowell, Mass.
 Geo. W. Fifield, machinist, Lowell, Mass.
 Benjamin F. Stevens, machinist, Lowell, Mass.
 Alfred Nourbourn, machinist, Lowell, Mass.
 A. L. Wright, machinist, Lowell, Mass.
 J. J. Crawford & Son, steam-plate presses, steam boilers, &c., Nashua, N. H.
 Whittier Machine Company, by Charles Whittier, president, manufacturers of machinery, Boston, Mass.
 Geo. Schneller, iron and brass, Ansonia, Conn.
 • Wheeler & Wilson Mfg. Company, N. Wheeler, president, sewing machines, Bridgeport, Conn.

Ingot Pusher.

Steel ingots are generally cast in open-ended tapering iron molds, in which it sometimes happens that an ingot sticks so that considerable force is required to push it out of the mold and occasionally very great power is needed for the purpose. If a hydraulic ram were employed having a single plunger of sufficient power for the exceptionally heavy work there

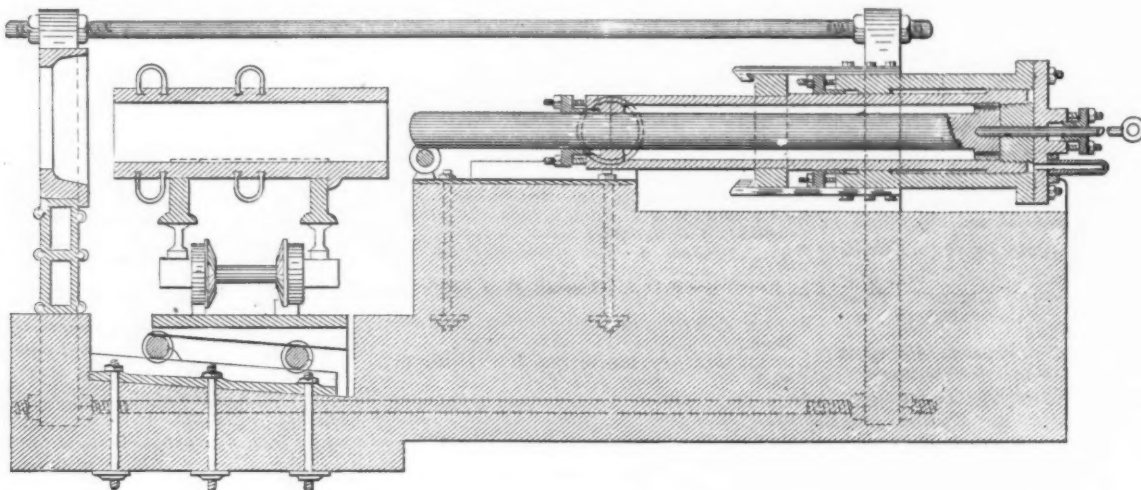
ing. The seat which serves as an abutment against which the mold is pressed is held to the cylinder by rods and the sides of the seat are made flaring, so that when the ingot is brought against it it is held centrally in regard to the opening. The larger plunger is usually locked and the smaller one applied to the end of the ingot to see if it has the power necessary to move the ingot from the mold. The first effect of the plunger as it advances is to push the table carrying the car up the incline and enter the mold into the seat, against which it presses during the forcing out of the ingot. After the mold becomes firmly seated the further advance of the plunger pushes the ingot out and discharges it upon a car placed the other side of the seat. In most instances the smaller plunger has power enough to do the work, but in exceptional cases the larger plunger is unlocked and brought into use for the purpose. It is evident that there is a great saving of power by using the smaller plunger alone in cases where it will do the work.

Testing the Forth Bridge.—The Forth Bridge was tested on January 21, under the superintendence of Sir John Fowler,

feet depth of hold, and will be put in service on the Magdalena and Cauca rivers. The other will be 74 feet long, 16 feet beam, 2½ feet depth of hold, to be used on the Lebriga. The boats will be built to run 14 miles an hour and will be fitted with compound engines of the most improved type. When finished they will be shipped by rail to New York, and from there will go by steamer to their destination. The cost of transportation almost equals the first cost of the boats. The first one taken down, however, about 18 months ago, paid for itself inside of a year.

Barges for Lake Traffic.

The American Steel Barge Company were formed a year ago with a capital of \$5,000,000 and recently contracted with Carnegie, Phipps & Co. for the manufacture of many tons of steel plates for "whale back" barges for the lake trade. The cost of one of these barges without steam is about \$75,000, and the company expect to turn out one every 30 days. Of those already in commission the third will serve as a model. She is 260 feet long over all, 36 feet beam and 22 feet depth of hold.



MACHINE FOR PUSHING INGOTS FROM MOLDS.

would necessarily be a waste of power in operating such a ram for those cases requiring lighter work, since in the latter case the same quantity of water under pressure would be expended in operating the ram while the latter was doing its minimum amount of work. The pusher here illustrated, and which is the invention of Samuel T. Wellman, of Cleveland, Ohio, avoids this difficulty by employing a ram having large and small telescopic plungers, so that only the needed amount of power may be used. In the main horizontal hydraulic cylinder operates a plunger which is, in fact, a hollow cylinder. In the bore of this plunger operates a smaller cylinder, the upper end of which is supported by a roller. The main plunger has crossheads on which are journaled flanged wheels traveling on suitable tracks, by means of which the outer end of the larger plunger is supported and guided in its forward and backward movements. The inner end of this plunger is formed with a bushing, which so far reduces its bore that the bushing overlaps the end of the inner plunger, so that when the inner plunger is returning to its first position it necessarily moves the larger plunger with it. Such of the ingots as cannot be discharged from the molds by ordinary means are loaded upon a car and transferred to the pusher, the mold and car then occupying the position shown in the draw-

ing. Mr. Benjamin Baker, Mr. Arrol and Mr. Stuart, the engineer who made the mathematical calculation in connection with the bridge. The official report issued on the results obtained is as follows: "Sir John Fowler and Mr. Baker, engineers of the Forth Bridge, have to-day tested the two 1700-foot spans by placing on the centers two trains, each made up of 50 loaded coal wagons and three of the heaviest engines and tenders, the total load thus massed upon the spans being the enormous weight of 1800 tons, which is more than double what the bridge will ever be called upon in practice to sustain. The observed deflections were in exact accordance with the calculations of the engineers, and the bridge exhibited exceptional stiffness in all directions. It may be interesting to record as further testimony of the strength of the Forth Bridge that during the recent heavy gale, when the wind gauges on Inchgarvie recorded a pressure of 37 pounds per square foot, the maximum lateral movement of the great cantilever was less than 1 inch."

Two steel steamboats are being constructed in Pittsburgh for use in South American waters under the superintendence of Commodore Arthur Stegman, of the United States of Colombia. The boats are stern wheelers. The larger one will be 138 feet long, 27 feet beam and 4

Her bottom is shaped like that of the ordinary lake or ocean-going craft, but the bow is rounded off a great deal more in the shape of a cone with the apex cut off. The stern is not unlike the bow. The deck is of a convex shape, like a turtle's back. On the forward and rear decks are built two turrets, in which are placed the machinery of the capstans and the steam steering apparatus. The boat is supplied with cabins, &c., below the deck for her crew. There are 12 hatches which traverse the turtle back, besides four, two on either side. The boat has double bottoms and eight water-tight compartments, each connected by 6-inch pipes with two Wellington pumps, which have a capacity of 700 tons of water an hour. There are 1000 tons of steel in the vessel. Her registered tonnage is 1132 tons, but she will carry a load of 3000 tons of ore or coal or 100,000 bushels of wheat on a draft of but little over 15 feet, something no other craft of anything like the dimensions of this boat on the lake can do. The company keep the barges in their own control. Two or three are said to be building for the coal trade on the Atlantic Coast.

The Phoenix Bridge Company have received the contract for the iron work in a new pier at Asbury Park, to extend 500 feet into the sea.

THE WEEK.

A company has been formed in this city, with a capital of \$500,000, to gridiron the park region with street railroads.

Elihu Spicer has given the Brooklyn Polytechnic Institute \$20,000 to found a library in memory of his son, Uriah D. Spicer, who graduated at the institute.

A Boston dispatch said there is to be organized in this country, previous to the eight-hour strike of May 1, 1890, a gigantic labor-financial alliance within the ranks of the American Federation of Labor. It is proposed to accumulate a joint stock fund of at least \$260,000 before May 1, to be placed at the disposal of any trade whose craftsmen may be on strike or locked out.

The Supreme Court of Iowa has affirmed the decision of the lower court declaring that the State law forbidding the payment of wages in anything but money is constitutional. This is a blow at mining corporation stores.

Over 9,000,000 acres of land in Dakota, comprising the Sioux Indian reservations, have been opened to public settlement.

In the last five years the average valuation of Boston has risen from \$661,011,076 to \$733,736,943, an advance of \$72,725,867. Meanwhile there is a total addition of \$1,643,665 to the amounts raised under the tax limit.

The "wooden nutmeg" of Connecticut is eclipsed by the paste coffee berry. Shippen Wallace, State Chemist of New Jersey, believes that its enterprising inventor has been located and identified. It is known that 1500 pounds of spurious coffee were bought in Philadelphia by one of the leading wholesale grocers of New Jersey. Mr. Wallace has made an analysis of the new coffee, and he reports that it is composed principally of a paste made of cracker dust, chickory and molasses, and it is given the form of a coffee bean by pressure in a mold. Mr. Wallace regards it as one of the biggest swindles on record. It is a splendid imitation of the coffee bean, and it is only by breaking it that the imposition can certainly be discovered.

The phosphate lands of Florida are suddenly discovered to possess great value and are eagerly bought for speculative purposes. The material sells at \$5 per ton on board the cars, and the deposits count thousands of tons to the acre. A letter from Jacksonville says large sums of money have lately been invested in phosphate lands, perhaps several million dollars.

The Illinois Bureau of Labor Statistics has decided to begin a thorough investigation into the system of mortgages in that State. It will try and find out the number and amount of mortgages foreclosed last year and compare them with the total number and amount of mortgages held. Some indication can be gained in this way of the profit or loss to farmers of borrowing money on their lands. A record will also be made of the farm lands sold during the year and the prices obtained per acre.

The well-known American traveler in Siberia, George Kennan, discourages any investment of American capital in the proposed Siberian railway. "An American capitalist," he says, "may think the offers good, even quite seductive, as presented by the Russian Government, but they are not. When the transcontinental lines were built in this country the Government backed them with subsidies in money and land grants, but in Russia it is different. There is no chance for settlement, as there was on American lines. The Government will not permit emigration in masses. The

Government would never make any land grants to a railway company, and with the present corrupt officials the country generally will never be enabled to develop its resources. The Russian Government, in fact, does not care for the industrial side of the project. It wants a railroad for military purposes. Russia is apprehensive of a Chinese invasion in the Amur region, and her sole aim is to place herself in a position to throw an army of soldiers on that frontier whenever required."

Professor Greenhill, of England, working on the law of corresponding speeds, as deduced by Mr. Mansel's and the late Mr. Froude's "Methods of Analyzing the Results of Progressive Speed Trials," takes the City of Paris type as a model, and declares that in order to build a vessel that will cross the Atlantic inside of five days she must be designed for 30,000 tons displacement, 65,000 indicated horse-power, have a length of 807 feet, a beam of 91 feet, depth of hold 60 feet, and a draft of from 31 to 32 feet. The City of Paris is of 10,000 tons displacement, and from this some comparison can be made of relative sizes. On the other hand, prominent naval constructors are inclined to question the practicability of Professor Greenhill's ideas, and declare that 4½-day ships can be built on the lines of many of the vessels of to-day. The general opinion, however, is that the 4½-day ship must be 600 feet long, have a beam of 70 feet, a draft of 28 feet, a displacement of 19,000 tons and an indicated horse-power of 40,000.

To increase the depth of water on Shell Reef, in the East River, between Grand and Twenty-third streets, from 9 to 18 feet will cost \$268,000.

The receipts of the American Institute from all sources last year were \$43,803. The total assets are \$241,375.

The annual report of savings banks in Connecticut shows an increase of \$4,520,883 in the total amount of deposits during the year. The total amount deposited in the 86 banks is \$110,370,962. The Society for Savings in Hartford has \$12,291,157 in deposits. The Norwich Savings Society stands next, with deposits amounting to \$8,522,235. The New Haven Savings Bank has a total of \$6,663,485 in deposits. The increase in total assets is \$4,826,898, and the whole number of depositors is 294,896, being a gain of 7120 during the 12 months.

Vessel-owners at all the lake ports protest against the adoption by the Government of a load line for lake vessels.

The destruction by floods in the Willamette and Columbia rivers in Oregon amounts to several million dollars. Land slides were serious, obstructing the railroads.

The demand for Siemens steel for the construction of warships in England is said to exceed the facilities for producing it, and in consequence there has been a partial reversion to iron plates.

Like the whisky pool, the Linseed Oil Trust is said to have taken alarm at the hostile legislation encountered in various districts and, as indicated by circulars sent out, will reorganize under the laws of Illinois.

The American Building and Loan Association, of Minneapolis, doing a business of about \$1,000,000 per annum, will probably be wound up. The public examiner reports a deficiency of \$74,718, after an existence of two years, or about 6 per cent. of the total sum received. The institution has agencies all over the country, through which large sums have been invested. The system of doing business appears to have been loose, to say the least, and it is thought that other associations of a like character require

investigation. An effort is now being made by local building associations in this State to prevent these so-called national building associations from doing business here, as they claim that the methods of these corporations are injurious to the co-operative principle which they represent.

The House Committee on the Judiciary has ordered a favorable report on the Culberson bill for the creation of a Court of Patent Appeals. The bill provides for five judges at salaries of \$7500 each. The court is to be a court of final appeal and is designed to relieve the United States Supreme Court of the patent cases that under the present law are appealed to it.

For the third time the price of American window glass has been advanced this season. At Pittsburgh, on the 4th inst., the Western Window Glass Association advanced the price 5 per cent.; but these goods are still from 5 to 10 per cent. lower than they were a year ago. Eastern prices are not affected in the absence of competition between the East and West. It was stated as an encouraging feature that the best brands of American glass are now taking the place of foreign glass in the Eastern markets, gas-made glass being in many cases preferred to French glass. The American Window Glass Importers' Association at Springfield, Mass., announce an advance of 10 per cent.

The plans for a deep water harbor at Galveston, Texas, call for a mean depth of 30 feet on the bar, and the estimated expense is \$7,000,000, of which \$800,000 has already been appropriated. It is calculated that four miles of jetties will be completed under the present contract by next June. So far the work has been confined to what is called the south jetty, a compact wall which already extends 16,000 feet beyond the northeast corner of Galveston Island and requires to be carried at least four miles further to reach the crest of the bar.

New York owners of real estate are surprised to learn from the taxbooks that the valuations of city property are increased this year over last year's valuations by something more than \$68,000,000. This increase is nearly double that of the majority of other years since 1870, and at least \$20,000,000 more than the highest increase within that period. Although the rate at 1.95 is lower than it has been except in the year 1889, the actual amounts in taxes which will fall upon individual property are in very many cases larger than when the rate stood at 2.12. This discovery has already gone far to lessen the appreciation of the boast made last summer that for the first time in the history of the city the tax rate had been reduced below 2 per cent. under the administration of Mayor Grant. Taxpayers, as a rule, would much prefer that the rate should be 3 per cent. or higher and the valuation enough lower to reduce the amount of actual tax payments.

Open navigation on the Hudson at this time in the year is phenomenal, but not without precedent. During the last 60 years navigation opened 42 times in March, 11 in April and 6 in February, while during the years 1870 and the winter of 1889-90 the Hudson was not closed at all. The latest opening was in 1843, when the channel did not become clear until April 13. The earliest opening was in 1842, when February 4 was the date of resumption of navigation.

The last Congress authorized the Agricultural Department to make a special investigation into the subject of food adulteration, and it has prepared some rather startling information on the subject. According to the report of the special agent, about 15 per cent. of the food sold in this country represents "adulteration, sophis-

tication and misbranding, making a total loss to the people of about \$675,000,000 a year." The export trade is said to have been greatly injured by the adulterations, particularly in butter, cheese, lard and other agricultural products. This and the general sale of adulterated food in this country, it is claimed, not only depreciate the price of farm products, but spread broadcast disease. Legislation is urged in the interests of the honest merchant and trader, who is now often exposed to ruinous competition by the unscrupulous dealer who sells adulterated articles. The consumer is thereby robbed in pocket as well as in health and public morality is lowered. A valuable feature of the proposed legislation is the official publicity which it proposes to give to the examination of food by the bureau to be established for that purpose.

The question of removing the emigrant landing at Castle Garden still puzzles the authorities.

New York truckmen, who number 9000, demand \$1 per hour for detention at piers and warehouses beyond one-half hour, and the Law Committee of the Board of Aldermen favor their application.

Rope manufacturers in New York deny the report that there exists a cordage syndicate either in New York or Canada.

New York tenants are expected to give notice as soon after February 1 as practicable respecting their intentions for another year. Already landlords have in numerous instances reached an understanding on this subject, and it does not appear that any radical changes are in prospect. Down town the new office buildings are usually occupied as soon as finished. Below Chambers street rents remain at about last year's figures. The demand for business accommodations is greatest, as it has always been, close to main lines of travel. Little need be said in regard to the produce commission district, for changes occur there probably less frequently than in any other section of the city. The dry goods district also holds its own quite well in respect both to tenants and to rentals. Further down town the demand is chiefly on Broadway and on side streets convenient to Broadway as far south as Wall street. Rentals for houses in the "tenderloin" section are maintained at last year's prices. In some parts they show a decided improvement. On the west side of the city above Fifty-ninth street building operations have kept pace with the needs of the tenants, and there is abundance of accommodation at reasonable prices for all classes. The east side of the city above Fifty-ninth street remains practically the same as last year. The city of Brooklyn shares in the prosperity of New York, by reason of her contiguity.

Under the new contract for lighting Brooklyn the gas companies get \$19.80 per year for each lamp and the electric companies \$182.50 per lamp.

The national debt left to Brazil by the monarchy amounts to \$1,000,000,000, equal to the estimated receipts of the State for the next seven years. The Minister of Finance urges the pruning of expenses, elimination of useless departments and the filling of offices by persons of merit and capacity.

The importance of the traffic on Long Island Sound is hardly appreciated. The value of merchandise transported through the Sound during the last year is estimated by Colonel Houston, chief of the United States Engineer Corps for that district, at \$1,028,000,000. In the New York traffic alone the port of New Haven sends out merchandise valued at more than \$1,000,000 every day in the year.

MANUFACTURING.

Iron and Steel.

The Iron and Steel Band Company, Limited, of Pittsburgh, have recently made some additions and improvements to their plant and have commenced the manufacture of the Baylee patent annealing box.

Jones & Laughlins, Limited, of the American Iron and Steel Works, at Pittsburgh, have commenced the erection of an additional blooming mill, which will be a duplicate of their present mill. The Morgan Engineering Company, of Alliance, Ohio, will furnish the main engine and the Crane Elevator Company, of Chicago, will furnish six reversing engines for the manipulation of the billets.

On the 1st inst. the Oliver Iron and Steel Company and the Oliver & Roberts Wire Company, Limited, of Pittsburgh, paid the last installment of their indebtedness, amounting to more than \$300,000. In the last five years these firms paid over \$1,500,000, which they owed when they secured an extension.

Everett Furnace, at Everett, Bradford County, Pa., owned by Joseph E. Thropp, is now making about double the output which was obtained as an average by the Everett Iron Company when they owned the furnace.

Wharton Furnace, formerly the Port Oram, at Port Oram, N. J., has been remodeled, its height having been raised to 75 feet. It will go into blast immediately under the management of Tooke Straker. It will make neutral forge and foundry iron from three quarters Hibernia magnetite and one-quarter Lake Superior hematite. It will run on three-quarters anthracite and one-quarter coke and will have a capacity of 500 tons a week.

Hill Clapp, secretary of the West End Rolling Mill Company, of Lebanon, Pa., has secured the contract for about 100 tons of heavy cable chains, let at St. George's, New York Bay, by the Government.

The South Side Furnace, Boiling Springs, Pa., is now in operation and will continue in blast until May 1 with present stock of charcoal.

The Bedford Coal and Iron Company, of Bedford, Pa., with a capital stock of \$200,000, have been chartered. John Cenna is one of the directors.

The furnace of the Carp River Furnace Company, Marquette, Mich., is rapidly nearing completion, and will probably be added to the list of charcoal producers by the middle of the month. The new stack was built to take the place of the furnace built in 1873, and which was burned in 1882, and will produce about 30 tons a day. Mr. Solon Burt, treasurer, Detroit, who sells the product of the Peninsular Iron Company, will also handle the Carp River's output.

The Sharon Iron Company, of Sharon, Pa., will now commence the erection of six additional furnaces in their puddling department. Several additions will also be made to their sheet mill department in the near future.

The Langdon (Ala.) Furnace, rebuilt from the old Stonewall Furnace, and owned by the Langdon Iron Company, will be lighted about the 25th inst. The product will be about 40 tons of car-wheel iron per day, and will be handled by Rogers, Brown & Co., of Cincinnati.

At a meeting of the stockholders of the Wheeling Steel Works, held in the office of the company, at Wheeling, W. Va., on Tuesday the 4th inst., the following directors were elected for the year: On

behalf of the Benwood Iron works, Alonzo Loring, A. W. Campbell and George Wise; on behalf of the Belmont Iron Works, J. D. DuBois, H. M. Russell and A. J. Clarke; on behalf of the Wheeling Iron and Nail Company, C. D. Hubbard, H. H. Hornbrook and Geo. K. Wheat. A. J. Clarke was re-elected president of the board and Andrew Wilson secretary.

The affairs of the Etna Iron Works, of Ironton, Ohio, are hung up in the Hamilton County Circuit Court on a question of the jurisdiction of the Common Pleas Court in appointing a receiver and ordering the sale of the works. A decision is expected in a short time. If the decision sustains the Common Pleas there will be a sale of the property. It has already been appraised at \$600,000, as follows: Blanche and Alice, \$375,000; Sarah, \$56,000 and Etna and Vesuvius, \$169,000.

There is a prospect that the puddling department of the West Hamburg Rolling Mill, at Hamburg, Pa., will soon resume operations after being idle for a number of years. It is understood that the Pottsville Iron and Steel Company, of Pottsville, Pa., are negotiating with the Philadelphia and Reading Coal and Iron Company, the present owners, for a lease of that part of the property.

Giles Everson and Frederick W. Barker are offering for sale the Syracuse Iron Works, at Syracuse, N. Y.

The total finished product of the 119-inch plate mill of the Homestead Steel Works, of Carnegie, Phipps & Co., Limited, at Homestead, Pa., for the month of January last, was 4567 tons.

The Keystone Construction Company, of Pittsburgh, have declared a semi-annual dividend of 5 per cent., payable on and after the 15th inst.

A blast furnace is projected at South Chicago, Ill., as an independent enterprise, by capitalists who have been impressed with the advantages offered by the location for the cheap manufacture of pig iron and by the increasing importance of the market for pig iron in the Northwest. Lake Superior ore can be landed on the company's dock without an inland rail haul or the cost of reloading. It is further rumored that a blast furnace may be erected in the near future at an interior point in Illinois for the manufacture of foundry iron.

Soho Furnace, of the Moorhead-McCleane Company, at Pittsburgh, turned out 6070 tons of iron during the month of January last.

The stockholders of the Lebanon Mfg. Company, of Lebanon, Pa., have voted to increase the capital stock from \$174,000 to \$300,000. This advance has become necessary by reason of the increase in business, which has never been better, and is steadily enlarging in its scope.

D. R. Lean, engineer and contractor, Penn Building, Pittsburgh, has contracted with the Monongahela Furnace Company, of McKeesport, Pa., for all the brickwork for their two-blast furnaces and seven firebrick hot-blast stoves. The furnaces will have 20-foot boilers and be 80 feet in height, while the stoves, which are of the Cowper-Kennedy design, will be 22 feet in diameter by 72 feet in height.

The Chickies (Pennsylvania) Rolling Mill resumed operations on Monday, after a long suspension.

The National Tube Works Company, of McKeesport, Pa., are making a number of extensive improvements at their plant. A number of new puddling furnaces are being erected and a complete set of new pumps is being built. When the improvements are completed a large number of

additional men will be given employment. The company at present are filling large orders for special pipe used in the manufacture of ice machines in the South.

The plant of the Continental Tube Company, at Laughlin's Station, near Pittsburgh, is offered for sale. It contains two lap-welding furnaces, one butt-welding furnace, one tongue-welding furnace and 15 bending, tagging and heating furnaces.

The wages of the employees of the Allentown Iron Company, of Allentown, Pa., have been increased 10 per cent., the increase dating from the 1st inst.

The Bryden Horseshoe Company, of Catasauqua, Pa., have just received a large order of horseshoes from the Great Horse Railroad Company, of Berlin, Prussia. The order will be shipped to its destination in a few days.

The annual meeting of the stockholders of the Stewart Iron Company, Limited, of Sharon, Pa., was held at that place on Tuesday the 4th inst. Among other business transacted was the election of officers. All the former officers were re-elected, as follows: Chairman, Fayette Brown; secretary and treasurer, Harvey H. Brown; secretary, D. B. Chambers, all of Cleveland; Board of Managers, the above named gentleman and Ralph Hickock, of Cleveland, and Hon. S. McClure, of Sharon.

We are informed that the building of a new wire-rod mill will soon be begun in Eastern New Jersey.

Machinery.

Thomas Carlin's Sons, of Allegheny City, Pa., have purchased the machinery in the plant of the Columbus Steel Company, of Columbus, Ohio, which has been idle for some time. The original works were built in 1872 to roll rails, but were changed in 1886-7 to a steel works. The plant consisted of two 15 gross ton open-hearth furnaces and the necessary machinery for the production of blooms, billets and slabs.

On the 1st inst. several changes took place in the firm of Samuel Tretheway & Co., Limited, manufacturers of rolling-mill machinery, located at Pittsburgh. Samuel Heppenstall and Uriah Sinker being admitted to the firm, while John Kenworthy retired. Mr. Heppenstall has been chosen secretary of the newly organized company. Additions have recently been made to the shop equipment, consisting of lathes, planers and drill presses to the amount of \$3500.

James McNeil & Bro., proprietors of the Vulcan Tank and Boiler Works, at Pittsburgh, have recently received an order from the Monongahela Furnace Company, of McKeesport, Pa. for 32 boilers, each to be 30 feet in length and 4½ feet in diameter. Work will be commenced as soon as possible, and they expect to complete the order during the next three months.

The Fred. J. Meyers Mfg. Company, Covington, Ky., on the 1st inst. removed their branch store and warehouse in Cincinnati from 169 to 173 Main street, where they occupy a building with double the capacity of the former, the intention being to carry a complete stock of the various specialties produced by them. The management of the branch establishment continues under Thos. G. Randall, as heretofore.

The Muller Machine Tool Company, Cincinnati, Ohio, are making some radical changes in their establishment. A new machine shop is being arranged, 65 x 100, two floors, in which \$15,000 worth of new machinery will be placed for the production of the Muller lathe. A new stock and ware house, 50 x 100, two stories, brick, will also be erected. Among the principal machines to be placed in the new

shop will be two 62 x 62 x 26 Gray double-head planers. The new establishment will have facilities for employing 100 men, and the productive capacity will be three times greater than that heretofore possessed. The entire premises will be illuminated throughout by electricity and heated by steam. The company occupy ground equal to about 2 acres adjoining the C., H. and D. R. R. in the western portion of the city, and have ample shipping facilities.

The Geo. A. Gray Machinery Company, Cincinnati, Ohio, state that one of the best months for business they have ever experienced was that of December, 1889, January of the present year not making quite as good a showing. The indications for February point toward a notable improvement in that direction, their principal demand being for planers.

The Pond Machine Tool Company, through their selling agents, Manning, Maxwell & Moore, 113 Liberty street, New York, have received an order from the Ordnance Department of the United States Government for ten large lathes, for the work of turning, boring and finishing guns of 8 to 12 inches caliber. The contract amounts to \$247,800. The time of delivery extends over a period of about three years, which enables the Pond Machine Tool Company to take care of their regular work promptly, and does not materially reduce the production of their shops for regular railroad and machine shop trade.

Stephen E. Clevers & Son, of the Portage Lake Foundry, Stoughton, Mich., have largely extended their works. The new foundry is 60 x 120 feet and contains three 4-foot cupolas. The machine shop is 40 x 120 feet. It contains the largest lathe in the lake country outside of one in the shops of the Calumet and Hecla Mining Company.

The Lloyd-Booth Company, founders and machinists, of Youngstown, Ohio, have been compelled by reason of their increased trade to purchase more land and have commenced the erection of an addition to their foundry which will double their capacity. They will add to the same a 30-ton steam-crane to facilitate their work, and hope to be able with the improvements under way to fill orders more promptly than heretofore. They are now shipping a sheet and plate mill to the Cambridge Iron and Steel Company, of Cambridge, Ohio, which is only one of the numerous contracts they now have on hand. They are making shears and roll lathes for the Chicago Forge and Bolt Company, of Chicago, Ill., and shears for the National Forge and Iron Company, of Chicago, Ill., for whom they have previously furnished six.

Owing to their rapidly-increasing business in the sale of their boilers in Western Pennsylvania and Ohio, the Babcock & Wilcox Company, of New York City, have opened a branch office at Room 408 Lewis Block, Pittsburgh. It will be in charge of Mr. W. C. Temple.

Hardware.

The Peters Cartridge Company, Cincinnati, Ohio, have been exceedingly pressed to fill orders for some time past for their cartridges. Heretofore the shells for these goods have been only filled by them. They have now in course of erection a new brick structure three stories high for the exclusive manufacture of shells and an additional building 40 x 40 to be used as a warehouse; about \$15,000 worth of machinery for the manufacture of the shells and powder will be added. At a recent meeting of the stockholders the capital was increased from \$50,000 to \$100,000 paid up. The stock of the King Powder Company, which is under the same manage-

ment has been increased from \$325,000 to \$500,000 paid up. The blasting and gunpowder marketed under the above name has been in excellent demand, particularly the former. The increase in the capital stock referred to and the additions in manufacturing facilities now under way place this company on an equal basis with the largest establishment of the kind in the country. The offices of the company have also been removed from 6, 8 and 10 West Third street to 1, 3 and 5 of the same street.

The Douglass Axe Works, at Milford, Mass., which were recently sold, were purchased by Mann & Hubbard, of Washington, Pa., for \$150,000, not much more than half their value.

The National Screw and Tack Company, Cleveland, Ohio, who were organized in June last, are now turning out goods in their tack department and in April will be prepared to supply screws. We are advised that they have received a large number of orders for tacks. Mr. D. Elliott, the superintendent, was master mechanic for the Union Screw Company for 13 years.

Miscellaneous.

The Berlin Iron and Lead Works of N. G. Price & Co., located in Pittsburgh, are to be removed to a tract of land near Penn Station, located on the line of the Pennsylvania Railroad. The new site contains about 10 acres and the construction of the necessary buildings will soon be commenced.

The following new corporations have recently been created in Michigan: Monroe Foundry and Furnace Company, of Monroe, \$20,000; Elba Iron Company, of Negaunee, \$1,000,000; Bessie Mining Company, of Negaunee, \$1,000,000; Gotham Mining Company, of Marquette, \$2,000,000; Eureka Iron Mining Company, of Gogebic County, \$1,000,000; Lake Superior Granite Company, of Marquette, \$1,000,000; Barasa Iron Mining Company, of Marquette, \$1,000,000.

The National Pulley Covering Company, of Baltimore, Md., have appointed Charles A. Turner, No. 1 Market street, Pittsburgh, the agent for Pittsburgh, Allegheny and vicinity.

The Tennessee Range and Mfg. Company, have moved to Evansville, Ind., where they will continue to produce with better facilities ranges, pumps and steam heating apparatus.

The Shelby Iron Company, of Shelby, Ala., whose stock is chiefly owned in Hartford and vicinity, have been sold to a New York and Southern syndicate, headed by Mr. Parker, an iron manufacturer, of New York. The capital stock was \$600,000, in shares of \$100 each, and 2000 shares were held by a single investor, Newton Case, of the Case, Lockwood & Brainard Company, of Hartford. The sale is understood to be on the basis of \$150 per share. The property includes 40,000 acres, some of it is coal bearing, with furnaces at Shelby, which produce a fine grade of car-wheel iron.

The offer of Andrew Carnegie to expend not less than \$1,000,000 in public libraries for Pittsburgh was presented to councils on Monday and accepted. Nothing now remains but to select the sites and adopt plans for buildings. The city will give \$40,000 per year to maintain the libraries; Charles J. Clark, another millionaire, has offered a site, valued at \$100,000, in the East End for the central building.

The Pusey & Jones Company, of Wilmington, had \$58,000 for the construction of a revenue steamer at Newberne, N. C.

The Iron Age

New York, Thursday, February 13, 1890.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, JR., - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO
RICHARD R. WILLIAMS - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

The New England Petition.

It would be idle to deny that the petition of the New England manufacturers, printed elsewhere, will carry with it considerable weight. There are attached to it a number of signatures of concerns who occupy a leading position in the iron and allied trades of the United States. The greater number of the signatures represent hardware and machinery makers, a minority only ranking among iron and steel manufacturers proper. It is not our purpose to go into a critical analysis of the list of signatures as it now stands. The array of names is sufficient evidence, however, that really important interests in a great industrial section of the country feel that they are handicapped and have reached the conclusion that there is a chance for relief in the direction in which they are now striving. We have little doubt that as representative a list could be readily obtained among New England manufacturers engaged in the same lines of work who occupy quite different ground. Those who demand free coal and free iron ore and a reduction in the duties on pig and scrap do not really carry with them more than a part of the New England manufacturers. It would, we believe, be unfair to assume that the movement so persistently fostered is quite as general as may appear on the surface.

Still it is important and vigorous enough to command attention. So far as the placing of coal and iron ore on the free list is concerned, it would be of no little service to New England if the aim to be secured is the local manufacture of pig iron, because the reduction in the duty on the latter is relatively greater. Let it be assumed that the price of pig iron to the manufacturer would be lowered by the reduced cost of production through free raw materials, an assumption which may be granted only for argument's sake. This reduction would amount to about \$2.75 per ton of pig iron produced. But the lowering of the duty from \$6.72 to 25 per cent. would be equivalent to a reduction in the cost of laying down of foreign pig of about \$3.72, taking \$12 as a fair average price of makers' iron at foreign furnaces. Free ore would do the New England manufacturers no good. Nor would free coal be of any material aid to them. The majority of them could probably save more money by intelligent study of modern methods of burning fuel than they could possibly gain by using Nova Scotia coal as a club to beat down further the price of Clearfield, Cumberland, Pocahontas or West Virginia coals.

We do not believe that the methods by which the New England manufacturers are seeking relief will prove of much service to them, while they would seriously injure other sections of the country, with relatively far greater interests at stake. They will not overcome the influence of tendencies too potent to be overcome by reductions in the tariff. When the resources of the Northwest and the South were undeveloped, New England shared with New York, New Jersey and Eastern Pennsylvania not alone the trade of the country east of the Alleghenies and south of the Potomac, but it was a leading factor in the markets of the West. Crowded out of them, like the other producing districts east of the Alleghany Mountains, it was forced to compete in narrower markets with New York, New Jersey and Eastern and Central Pennsylvania. In that contest it has suffered most, but the producers of the Hudson River Valley, of Central New York, of New Jersey and of Eastern Pennsylvania have in greater or less degree shared in the hardships of which New England complains.

It is true that some of the leading producers in the districts named have uttered demands similar in their scope to those which some of the New England manufacturers now adhere to. But these are isolated cases only, the prevailing sentiment among the producers in the sections named being in favor of a continuance of the present rates. Natural causes have led to the shifting of the center of production westward. They cannot be overcome by the means advocated.

The Loss of the Atlantic Carrying Trade.

Is it correct to affirm that the most opulent, if not absolutely the greatest nation on the globe, as represented by the American people, must admit that the national will is thwarted, beyond remedy, as respects a due participation in the carrying trade of the Atlantic, now growing to enormous proportions, and of which the great bulk is the direct product of their own energy, the natural output of their steadily unfolding resources? After once entering the foremost ranks of those peoples most skilled in ocean navigation, sending their gallant clippers in triumph all over the world, and steaming to Liverpool from the United States in a shorter time than was ever before achieved, must they now acknowledge themselves vanquished?

The New York *Commercial Bulletin* devotes much space to the advocacy of free ships, and is no less persistent in its hostility to Government subsidies. The conclusion reached by the editor expresses itself in a single doubt. "We doubt," the writer says, "if under present conditions an American line, even if liberally subsidized, could hold its own in the Atlantic trade against vessels which are running without a dollar from any government." Can it be true that the American people at the present time awake to find

themselves effectually and perhaps permanently driven from the great ocean thoroughfare of the world? With all the accumulation of wealth in the Government treasury and out of it, is it not possible to maintain the stars and stripes at the masthead of a mercantile ship in the Atlantic trade? Eagerly every citizen may well inquire, "Why not?" The whole difficulty, according to the explanation offered by the *Bulletin* editor, is as follows:

It is about time that people understood the true reason why the American marine fails to revive. Of what use is it to misapply the experience of other nations, and deceive ourselves by supposing we can really construct a permanent marine with artificial props that may be withdrawn at any time? The truth is it costs more to build, own and operate vessels in the United States than in any other country in the world. Our Tariff enhances the cost of almost every article entering into the construction of a vessel, besides what is more important the labor and supplies necessary to run it. Our navigation laws deny us the right of purchasing foreign vessels or utilizing foreign labor, a right that is preserved to every other branch of trade. We are compelled to buy both our tools and our labor in the highest market. Hence we do without and let others supersede us. When we realize that the American flag is the most costly in the world to carry from port to port, we may begin to understand the true cause of its disappearance.

Surely these are momentous words, if founded on fact. Here is the solution of the problem that none have been able to demonstrate, either in the forum or through the newspaper press, so effectively, conclusively and absolutely, as to evoke corresponding legislation by which the stupendous evil may be remedied. We are told that "labor," the "tariff," the "navigation laws" all together constitute an insuperable barrier to defeat the national aspirations and that we are "superseded." Is there no alternative but supinely to acquiesce? Our legislators are convened at Washington and their constituents await a response.

An Ore Exchange for Milwaukee.

A movement to change the present system of selling the iron ore mined in the Lake Superior districts is on foot in Milwaukee. The idea is to do away with the Cleveland ore agents, and have the mine-owners make the sales directly to the consumers. On the estimated output of 9,000,000 tons for this year the commissions alone would amount to \$900,000. If such a change can be effected an iron exchange will be built in Milwaukee, as local companies now control at least one-half of the ore output of the Lake Superior district. Undoubtedly such a project will be favored by Milwaukee interests, as much more business would accrue to banks, and many of the financial operations indirectly connected with the sale of ore and its shipment would also accompany the primary transactions. But it will be a very difficult matter to introduce a new system of making sales or to transfer this important part of the business to a point so remote from the bulk of the consumers of Lake Superior ores. The concentration of the commercial interests in iron ore at Cleveland has been gradually built up, having

been founded in the first place on the evident advantages presented by that location. It is true that other lower lake ports have largely diverted from Cleveland the receipts of ore for shipment to interior points, but that is a minor matter compared with the business of selling the ore itself.

It would be a serious matter to Cleveland if the Milwaukee project were to be undertaken and should meet with even a fair degree of success. But considering the geographical location of the two cities, with regard to the present centers of consumption of lake ores, it would seem to be out of the question to transfer the sales departments to Milwaukee, as indicated. In the course of time, as the manufacturing interests of the great Northwest rival in number those of the more Eastern districts, the change will probably occur, but the time is evidently not yet at hand. A great deal of lake ore is consumed at Chicago and in its vicinity, but the number of buyers is small as compared with the buyers of Ohio and Pennsylvania, whose natural ore market is Cleveland.

Pig Production Stationary.

Our monthly blast furnace report, the details of which we publish below, shows that the production of pig iron remained practically stationary during January. A falling off in some districts was compensated for by an increase in others:

As compared with previous months the record stands as follows:

	Furnaces in blast.	Capacity per week.
February 1.....	334	173,651
January 1.....	333	174,038
December 1.....	328	169,151
November 1.....	323	165,225
October 1.....	311	151,057
September 1.....	294	134,068
August 1.....	286	145,899
July 1.....	285	141,419
June 1.....	286	137,119

The status of the anthracite furnaces was as follows:

Anthracite Furnaces February 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	23	11	4,061	12	3,154
New Jersey.....	14	5	2,427	9	3,285
Spiegel.....	3	3	1,219	0	0
Pennsylvania:					
Lehigh Valley.....	40	36	13,778	10	2,846
Spiegel.....	1	0	0	1	57
Schuylkill Valley.....	37	16	6,727	21	6,020
U. S. Susquehanna Valley.....	17	11	4,167	6	1,300
Lebanon Valley.....	16	14	7,164	2	522
L. S. Susquehanna Valley.....	18	11	5,325	7	1,920
Totals.....	175	107	43,905	68	19,004

For the past 14 months our records show the following:

	Furnaces in blast.	Capacity per week.
February 1, 1890.....	107	43,905
January 1, 1890.....	105	42,857
December 1.....	100	40,053
November 1.....	96	40,603
October 1.....	94	36,558
September 1.....	93	35,997
August 1.....	88	34,277
July 1.....	89	34,142
June 1.....	91	34,386
May 1.....	95	35,315
April 1.....	102	37,977
March 1.....	103	37,937
February 1.....	107	39,187
January 1, 1889.....	107	38,726

The status of the New York furnaces has remained the same during the past month, nor have there been any changes in the New Jersey furnaces. In both states, however, preparations are going forward to increase production, new parties having taken hold of the Onondaga, while Wharton and Pequest, in New Jersey, will be producers at an early date. In the Lehigh Valley Glendon has blown in a third furnace during January, and the Coplay is remodeling one of its stacks. Bethlehem has now both Northampton and Lucy in blast. The Thomas Iron Company are running every one of their stacks. The Spiegel furnace of the Lehigh Zinc and Iron Company, at Bethlehem, went out for repairs in January. In the Schuylkill Valley Anvil has blown out and Swede is temporarily stopped. To offset this, No. 3 Pioneer went in on the 23d ult., and during the current month both of the Keystone furnaces are expected to be producing iron. Temple is getting ready to go in during the month. In the Upper Susquehanna region one of the Montour furnaces started late in January, but on the other hand Union ceased work during the month. In the Lebanon Valley no changes are reported nor has any movement of consequence taken place among the furnaces on the Lower Susquehanna. Chestnut Hill has one furnace ready to go in, having waited for coke nearly two weeks.

The following is a summary of current capacity of coke furnaces:

Coke Furnaces February 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	4	3	3,017	1	1,180
Pennsylvania:					
Pittsburgh district.....	20	18	21,381	2	1,623
Spiegel.....	1	1	672	0	0
Shenango Valley.....	19	17	12,300	2	1,224
Juniata and Conemaugh valleys.....	17	13	6,490	4	3,010
Spiegel.....	1	0	0	1	500
Youghi. Valley.....	5	4	2,204	1	173
Miscellaneous.....	4	4	2,902	0	0
Maryland.....	12	12	1,960	0	0
West Virginia.....	6	3	1,751	3	1,256
Ohio:					
Mahoning Valley.....	15	13	11,286	2	1,529
Central and Northern.....	18	14	10,576	4	2,622
Hocking Valley.....	15	5	1,825	10	2,046
Hanging Rock.....	14	7	1,394	7	1,210
Indiana.....	2	2	370	0	0
Illinois.....	13	10	11,220	3	3,096
Wisconsin.....	4	4	2,326	0	0
Missouri.....	5	1	483	4	1,766
Colorado.....	2	1	534	1	475
The South:					
Virginia.....	13	10	5,254	3	906
Kentucky.....	4	3	669	1	310
Alabama.....	29	24	15,024	5	2,350
Tennessee.....	11	10	4,910	1	500
Georgia.....	2	0	0	2	890
Totals.....	226	169	118,368	57	25,626

As compared with the 15 previous months the active coke furnaces make the following showing:

	Furnaces in blast.	Capacity per week.
February 1.....	169	118,368
January 1, 1890.....	169	119,396
December 1.....	162	116,319
November 1.....	160	112,269
October 1.....	154	102,454
September 1.....	141	96,744
August 1.....	137	96,720
July 1.....	136	96,584
June 1.....	135	91,771
May 1.....	147	98,399
April 1.....	151	100,060
March 1.....	150	100,757
February 1.....	150	98,518
January 1, 1889.....	157	103,726
December 1, 1888.....	151	101,748
November 1.....	146	94,695

During January the two furnaces of the Troy Steel and Iron Company reached their full production. In Pittsburgh there has been no change. Furnace H, one of the new Carnegie stacks, will probably be ready early in March.

Full work continues in the Shenango Valley, where now Alice is working and both Stewart furnaces are producing. The furnace of the Raney & Berger Iron Company, however, is soon to blow out for repairs. In the Juniata and Conemaugh valleys Everett has been added to the list of producers. There has been no change among the furnaces of the Youghiogheny Valley, nor among those which we group under miscellaneous. In the Mahoning Valley and in the central and northern part of Ohio the only change worthy of notice is that one of the furnaces of the Cleveland Rolling Mill Company has gone out of blast. In the Hocking Valley Winona has stopped. In Missouri only one plant was in operation during the greater part of January, but one of the Missouri furnaces has since resumed, having lighted on the 3d inst.

In the South Nannie B. blew in in Virginia, while in Alabama the Hattie Ensley started on the 1st and the second Pioneer was blown in. Anniston, however, stopped producing, and one of the North Birmingham furnaces of the Sloss Company is now out. There have been no changes in Tennessee or in Georgia.

The following table gives the status of the charcoal furnaces:

Charcoal Furnaces February 1.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England.....	14	7	590	7	530
New York.....	2	3	360	5	523
Pennsylvania.....	16	5	239	11	730
Maryland.....	5	1	110	5	512
Virginia.....	15	3	145	15	716
Ohio.....	11	7	390	4	338
Kentucky.....	1	1	109	1	57
North Carolina.....	4	1	70	3	163
Tennessee.....	1	1	1,079	0	0
Georgia.....	1	1	181	0	0
Alabama.....	14	9	2,104	5	1,233
Michigan.....	12	11	3,743	12	3,650
Missouri.....	3	1	331	2	304
Wisconsin.....	2	0	1,903	2	420
Texas.....	1	0	0	1	173
California.....	1	0	0	1	120
Washington.....	1	0	0	1	192
Oregon.....	1	0	0	1	190
Totals.....	124	58	11,378	76	9,815

As compared with previous months the year began as follows:

	Furnaces in blast.	Capacity per week.
February 1.....	58	11,378
January 1, 1890.....	59	11,485
December 1.....	66	12,779
November 1.....	67	12,393
October 1.....	63	12,047
September 1.....	60	11,327
August 1.....	61	11,902
July 1.....	60	10,727
June 1.....	60	10,962
May 1.....	54	10,629
April 1.....	53	10,173
March 1.....	55	11,081
Feb. 1.....	62	11,219
Jan. 1.....	67	11,946
Dec. 1.....	71	12,286
Nov. 1.....	73	12,734

In New England Kent furnace is temporarily out. In Pennsylvania Pine Grove furnace, of the South Mountain Mining and Iron Company, started smoothly again on the 8th inst. The furnace was blown out early in January because the bosh wall had fallen in. It was determined to use water blocks; three rings of bosh plates have been purchased of J. P. Witherow, of Pittsburgh. The water is fed through the plates under 27 feet head. In Maryland only one Stickney furnace is running. In Virginia Walton has just started to make a short blast. In Ohio Jefferson is out, and Olive is idle putting in a new Player stove. It will be ready to blow in soon. In Michigan Spring Lake resumed on the 28th ult. Midland, in Missouri, blew out for repairs on the 26th ult. Warner No. 2, in Tennessee, was idle during the greater part of January. In Alabama Gadsden started on the 31st

ult., while Shelby No. 1 was stopped on 22d ult. for repairs. Langdon will begin to make iron at an early date, while the new Tallapoosa Furnace in Georgia is nearly completed and is expected to enter the ranks of producers during the first week of March.

Among the producers of anthracite pig iron 45 furnaces, with an aggregate production of 61,078 tons in January, report stocks aggregating 25,708 tons unsold on February 1. Among the coke furnaces 97, whose total output in January was 270,411 tons, report stocks aggregating 94,157, while 25 active charcoal furnaces, with a January product of 24,620 tons, report a stock of 26,967 tons; 19 charcoal furnaces, idle on the 1st inst., report stocks of 12,905 tons.

OBITUARY.

D. B. COBB.

D. B. Cobb, of South Brooklyn, the well-known proprietor of the Cobb Surface Condenser Works, died of pneumonia on the 31st ult., aged 68 years. Mr. Cobb succeeded Wm. H. Lighthall, the original inventor of the surface condenser, and is said to have known more about condensers than any other man in the United States.

JAMES G. DARLING.

James G. Darling, an old merchant of Newark, died suddenly at his home in that city on the 10th inst. He was well known in business circles as a dealer in iron and steel, and for many years was identified with many financial institutions.

WILLIAM M. COWAN.

William M. Cowan, for many years at the head of the Whiting Mfg. Company, of New York, and since George H. Bliss' death manager of the Corliss Steam Engine Works, at Providence, R. I., died there on Monday night.

It has frequently been stated that a prominent advantage of twin-screw steamers is their security against complete disablement in case one of the engines breaks down, added to the fact that with one engine the vessel can be propelled at about three-quarters of the usual speed. A good illustration of these statements has recently been furnished by the Inman steamer City of New York, which broke one of the crank-pins of the port engine on her last eastward trip and finished the voyage with her starboard engine. A comparison of the daily runs under these circumstances with three daily runs of the preceding eastward trip gives the following results:

Daily runs—nautical miles—			
	with both engines.	with one engine.	Ratio.
1.....	474	375	0.791
2.....	461	352	0.829
3.....	417	352	0.844
Total and avs.	1,352	1,109	0.830

The above table further illustrates the enormous cost which the ocean racers must pay to produce their fine records and the comparatively slight increase in speed obtained by doubling the propelling power.

The price of coke was advanced in Pittsburgh on Tuesday from \$1.75 to \$2.15 per ton. This advance will meet the increase of 12 to 15 per cent. made in the wages of the employees last week.

In a very neatly printed pamphlet are gathered a series of essays lately written by Andrew Carnegie on the general subject, "The Gospel of Wealth." The first is reprinted from the *Pall Mall Gazette*, of which over 80,000 cheap reprints were sold in London in a very short time. A second article, entitled "The Best Fields for Philanthropy," appeared in the December number of the *North American Review*.

Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., February 11, 1890.

Owing to the consideration of the new rules which has been commenced in the House of Representatives, and will consume a week or ten days, the report of the new tariff bill will not be made as at first proposed until that subject shall have been disposed of.

General Benet, the Chief of Ordnance United States Army, having ordered a test of metal treated by the Redeman-Tilford process, has made the following interesting statement of the results:

ORDNANCE OFFICE, WAR DEPARTMENT, WASHINGTON, D. C., February 6, 1890.

Redeman-Tilford Steel Company, Washington, D. C.: GENTLEMEN.—The three pieces of steel treated by your process, which you left at this office December last, were sent to the Watertown Arsenal, Watertown, Mass., to be tested on the Government testing machine. The results are given in the within official report of December 28, 1889. Respectfully,

S. V. BENET,

Brig.-General, Chief of Ordnance.

ORDNANCE DEPARTMENT, U. S. A.

Report of Mechanical Tests Made with the United States Testing Machine, Capacity 800,000 Pounds, at Watertown Arsenal, Mass., December 28, 1889, for the Ordnance Department, U. S. A., Washington, D. C.

Tests by Tension.—Three pieces of steel from the Ordnance Office, Washington, D. C.
Tests by Compression.—Specimen turned down from base, 95 square.

MARK I.

Diameter, 564; sectional area, 0.25; gauged length, 2 inches.

General Summary No. 1.

Tensile strength, pounds per square inch of the original section..... 132,560
Elastic limit, pounds per square inch of original section..... 118,000
Elongation, per inch, after rupture..... Inappreciable.
Elongation, per inch, under strain of elastic limit..... 00,440
Reduction in diameter at point of rupture..... Inappreciable.
Reduction in area after rupture, per cent. of original section..... Inappreciable.
Position of rupture..... 6 inches from neck.
Character of broken surface..... Fine granular.

MARK 2.

Diameter, 564; sectional area, 0.25; gauged length, 2 inches.

General Summary No. 2.

Tensile strength, pounds per square inch of original section..... 168,400
Elastic limit, pounds per square inch of original section..... 108,000
Elongation, per inch, after rupture, inches..... 0.040
Elongation, per inch, under strain at elastic limit, inches..... 003,600
Reduction in diameter at point of rupture, inches..... 0.014
Reduction in area after rupture, per cent. of original section..... 5.0
Position of rupture..... 70 inches from neck.
Character of broken surface..... Granular, flaky.

Specimen No. 3 was very hard, difficult to mark with a file. This specimen broke in the shaper while undertaking to square off the end; 40 per cent. of the fracture was fine granular; 60 per cent. was discolored and had a dark-brown and blue color. The fracture occurred at what was apparently a fire-crack.

D. W. FLAGLER.

Lieut.-Col., Ordnance Dept., U. S. Army, Commanding.

The details of the tests were very elaborate, the applied loads varying from total pounds 250 to 33,140 at increments of 250 to 500 pounds and pounds per square inch 1000 to 132,560.

The Treasury Department has decided that various articles made of spelter and covered with brass to imitate bronze are entitled to entry at the rate of 35 per cent. ad valorem, as "plated and gilt articles." The Collector of Customs at New

York assessed duty at the rate of 45 per cent. ad valorem on a recent importation of this kind as unenumerated manufactures of metal.

The Coke Scale.

The committee appointed by the operators and workmen of the Connellsville coke regions for the purpose of drafting a scale of wages to govern prices for the ensuing year met in Scottsdale, Pa., on Monday of last week, and after a continuous session lasting four days a scale of wages was prepared and agreed to by both parties. On Friday the 7th inst. the scale was ratified by the Knights of Labor and on Monday the 10th inst. the following rate of wages went into effect in the Connellsville coke region:

Agreement made this 6th day of February by and between..... Company, party of the first part, and J. D. Rae, Robert Watchorn, M. P. Kaine, John De Haven, James Keegan, R. D. Kerfoot, committee representing all the workmen of said..... Company, at all the works of said..... in the Connellsville coke region, parties of the second part.

Witnesseth, That the following rates of wages and prices shall be paid by the said..... from the 10th day of February, 1890 (regardless of the price of coke), until February 10, 1891:

Mining and loading room coal, \$1.07 per 100 bushels; mining and loading heading coal, \$1.22 per 100 bushels; mining and loading heading coal, wet, \$1.32 per 100 bushels; mining and loading rib coal, \$1.07 per 100 bushels; headings in which two men work at the same time, 10 cents additional to above price of heading coal; heading prices to be paid for turning rooms in a distance of 30 feet from the center of the headings.

All cut-troughs ordered by mining boss when rooms are being driven and no others, to be paid for at heading price. All coal to be mined by measurement at the rate of 2688 cubic inches to the bushel.

The wagons to be loaded as at present. Roadmen, timbermen and horsebackmen in all mines, \$2.10 per day of nine hours' actual work; drivers, \$2.10 per full run; dumpers and tipplesmen, \$1.80; trappers, 83 cents; cagers, \$2.10. A full run not to exceed an average of nine hours' actual work, but all full "run men" must remain at work until all the ovens are charged or all work is for the day finished, if the management so elect, and are to be paid at the pro rata rate per hour for all the time worked over 54 hours per week, this extra time to be computed and placed to the credit of the men at the end of each month.

Roperiders to be paid the same as drivers; inside laborers, \$1.85 for nine hours' actual work; chargers, with horses or mules, 4½ cents per oven charged; chargers, with locomotives, \$1.90 for same work as done at present; charging engineers, \$2.35 for same work as done at present; cokedrawers, per 100 bushels charged, 61 cents; levelers, per oven, 10½ cents; loading and wheeling stock coke into cars, 30 cents per oven; ash carters, \$1.60 per day, ten hours; yard laborers, \$1.40 per day, ten hours.

Forking box and stock cars, less than 40,000 pounds capacity, \$1.10 per car; forking box and stock cars of 40,000 pounds capacity, \$1.20 per car; forking box and stock cars, over 40,000 pounds capacity, \$1.40 per car; forking small open top cars from yard, \$1.25 per car; forking medium open top cars from yard, \$1.50; forking large open top cars from yard, \$1.75 per car; all machinists, mechanics, firemen, engineers, pumpers and other classes of labor regularly employed at each plant not mentioned in the above list, to work same number of hours and to be paid an advance of 5 per cent. over the rates of wages paid in January, 1890.

It is distinctly understood and agreed that the management are to have the right to employ any person or persons they desire to employ and no others, and that the workmen shall not in any manner or form interfere in the matter of hiring or discharging of any foreman or boss.

Strikes or suspensions of work by the employees for any cause whatever shall not be allowed at any plant owned or operated by said..... Company during the term of this agreement, unless six days' written notice, stating difficulty, trouble or grievance, and asking for an adjustment of the same, signed, by local officers at the plant where the trouble or difficulty exists, and by the division officers of Division 4, N. T. A. 135, K. of L., shall have been previously given to the general superintendent of said..... Company at

his office in.....plant, and said..... Company shall not close down or suspend operations at any plant owned and operated by them in the Connellsville coke region (accidents and causes beyond their control alone excepted), unless six days' written notice shall have been previously given by said superintendent of said company to the division officers of said organization at their office in Scottsdale, Pa., and to the employees of said plant by posting written notice at said plant. Payments to be made semi-monthly.

The Phoenix Bridge Company's Injunction Continued.

In the Supreme Court in the City of New York a suit is pending with the Phoenix Bridge Company as plaintiffs against the Keystone Bridge Company, the Edge Moor Iron Company, the New Jersey Steel and Iron Company, the Passaic Rolling Mill Company, the Detroit Bridge and Iron Works, Geo. S. Field, Charles Macdonald, Chas. S. Maurice and Edmund Hayes, co-partners doing business under the name and style of the Union Bridge Company; C. J. Schultz, D. H. Andrews, John F. Alden, M. Lassig and "Edward" W. Eckert, the name "Edward" being fictitious, the true name of said defendant being unknown to plaintiff, said defendant being Commissioner of the American Bridge Manufacturers' Association, defendants.

Order to appear dated January 27, 1890, within 20 days after service of this summons.

That defendant, E. W. Eckert, has been duly appointed and is now acting as commissioner named in the agreements herein-after mentioned, with the powers and for the purpose herein set forth, and having among other powers that of making drafts upon the treasury of the association hereinafter named for the disposition of its funds.

That on or about the 7th day of April, 1887, at the City of New York, defendants named other than the defendant, E. W. Eckert, together with the plaintiffs and the copartnership of Cofrode & Saylor and the corporation known as the Morse Bridge Company, entered into a certain agreement whereby they formed an association called the American Bridge Manufacturers' Association.

That thereafter the corporation of the Morse Bridge Company and Cofrode & Saylor withdrew after giving the proper legal notice.

That parties above mentioned entered into an agreement whereby each member should pay into the treasury the sum of $\frac{1}{10}$ of one cent per pound on all ironworks of certain kinds in said agreement specified, to be kept and used for the purposes set forth in said agreement, including among others a guarantee fund in which each member should share under certain proportions.

Following is the agreement referred to: AGREEMENT.

The purpose of said association shall be to promote harmony among the bridge manufacturers of America by the consideration and discussion of measures conducive to their common interests and to carry out the provisions of this agreement among the parties hereto as hereinafter set forth. Officers for first year: A. L. Griffin, president; Fred. J. Slade, vice-president; Wm. H. Cornell, secretary and treasurer. Willard S. Pope, Chas. Macdonald.

The above officers while engaged in the interests of the association to be allowed \$25 per day and traveling expenses.

Entrance fee shall be \$52,000, to be contributed by the members in the following proportions:

	Per cent.
Keystone Bridge Company.....	10
Phoenix Bridge Company.....	16
Edge Moor Iron Company.....	9.75
Union Bridge Company.....	16
New Jersey Steel and Iron Company.....	7.75
Passaic Rolling Mill Company.....	7
Morse Bridge Company.....	5.75
Detroit Bridge and Iron Works.....	6.54

Cofrode & Saylor.....	7
C. J. Schultz.....	4
D. H. Andrews.....	2.76
John F. Alden.....	5.35
M. Lassig.....	2.1

To be known and designated as the Guarantee Fund, and to be increased from the first receipts until its amount shall become \$260,000, no surplus assets to be contributed among members until this amount has been reached.

The words "iron and steel work" shall include all kinds of wrought and cast iron and steel.

The above shall be payable monthly, and shall consist of 4-10 of 1 cent per pound of all ironwork made and sold by each of them, or purchased or imported and sold by them, shipped during the previous calendar month.

This includes material for railway bridges, viaducts, elevated railroads, aqueducts, marine piers, die-forged eye bars.

Judge Patterson of the Supreme Court continued the injunction obtained by the Phoenix Bridge Company, restraining the American Bridge Manufacturers' Association from doing anything detrimental to the interests of the plaintiffs in the association. The Phoenix Company's interest in the Association's Guarantee Fund of \$250,000 is \$40,000, and the company fear expulsion for declining to pay an assessment of \$33,202.78 made upon iron furnished by them in constructing the Fulton Elevated Railroad in Brooklyn. The company constructed the Kings County Elevated Railroad, and by resolution of the Manufacturers' Association were exempted from the payment of the customary assessment of four-tenths of 1 cent per pound upon the iron furnished in the construction of the Kings County Railroad up to 40,000,000 pounds. The Phoenix Company claim that the Fulton Railroad was constructed by the same syndicate, and was a continuation of the Kings County Road, and that, therefore, the assessment is invalid.

French Tin Plates.

A late number of the *Bulletin* contained the following article on the manufacture of tin plates in France, translated from *La Nature*:

During the last few years the tin plate industry has made great strides. The cause is to be ascribed principally to the ever increasing augmentation of the manufacture of all kinds of alimentary preserves. In one of the least industrial departments of France—Morbihan—there is a factory in which the manufacture of tin plates has assumed great importance. The works of Hennebont are about two miles above Hennebont, a little seaport $4\frac{1}{2}$ miles from the L'Orient roadstead, ascending the estuary of the Blavet. The place in which the valley is situated is called Kerglaur, which, in the Breton language, signifies "the village of rain." Having lately had occasion to visit those regions it was considered that a description of a metallurgical establishment, planted as though by chance in a country where the sky is so rarely obscured by the black smoke of the chimneys of large factories, would not be without interest.

The works of Hennebont were established in 1860 for the manufacture of sheet iron and tin plates. During the first years the production of the works was about 750 tons per year. In 1885 it reached 10,000 tons, and at the present it exceeds 12,000 tons. At the same time the little port of Hennebont, formerly almost completely deserted, frequented only by some fishermen, became very important. All the crude materials necessary for the manufacture come by ship to the locality. The materials are discharged in the port, unloaded in barges which ascend the Blavet, and towed by steam or horse power to the quays of the factory. The chief crude materials employed are coal (which comes direct from England, there being consumed on an average from 70 to 80 tons per day), pig

iron, scrap iron, carbonate of lime, magnesia, china clay, tin, chloride of zinc, grease and the acids used in the manufacture of tin plates. About 700 workers of both sexes are employed in the works, and the motive power used equals about 1000 horses, one quarter of which is supplied by a turbine fed by the Blavet, the remainder by different steam engines. The work of the factory may be classified into five principal parts: 1, the manufacture of the pig and scrap iron into steel ingots; 2, the manufacture of the ingots into bars and thin sheets; 3, the preparation of the sheets for the process; 4, the manufacture of the tin plates; 5, the decoration and stamping of the tin plates. We intend to pass rapidly in review these different phases of manufacture.

The Manufacture of the Pig Iron into Ingots.—The manufacture by the ancient methods of puddling and refining has been completely abandoned at the works of Hennebont and replaced by the manufacture of soft steel into ingots by means of Siemens-Martin furnaces, arranged specially for the treatment of phosphorus and sulphurous pig iron. At Hennebont there are two Siemens-Martin furnaces, each producing 22 tons of steel in 24 hours. These furnaces each employ two shifts of 30 men, who relieve each other at each casting. The time necessary for charging and obtaining the casting varies from 9 to 11 hours; two chargings can thus be made in 24 hours. The furnace is first charged with carbonate of lime, which at once forms, on contact with the heat, a basic slag of lime, which takes up the sulphur and the phosphorus of the pig iron and completes the purification of the metal. The furnace is lined with magnesia, on which this slag does not act. In spite of these precautions it sometimes happens that, the pressure of the gases being too strong, the heat becomes too great, melting the brick of the arch, which crumbles. When the steel is obtained it is cast into ingot molds of conical form, about 3 feet in height, and placed on a trolley in fours. The molds communicate by a tube in the lower part, so that the four molds are filled at the same time.

The Manufacture of the Ingots into Bars and Sheets.—This part of the manufacture employs about 300 workmen and brings into play almost the whole of the motive force. The steel ingot is first drawn into bars, and then into thin sheets or black iron. The steel ingots are heated in reheating furnaces, and then taken to a steam hammer, which shapes them and cuts them into two. The pieces are heated over again for half an hour, then passed to the bar trains, of which there are three. The bar train is an ordinary rolling mill, which draws the iron out, making bars from 20 to 23 feet in length, 4 inches wide, and 0.4 inch in thickness. These bars are at once cooled by immersion in water and cut into small lengths of from 8 to 12 inches in length, according to the length of the sheets to be made. These steel strips are taken red-hot to annealing furnaces, and then rolled by means of plain cylinders. On attaining a certain length they are folded into two by means of a special machine and again heated. They are then once more rolled to stretch them further, but two sheets are now rolled together, the first sheet having been folded into two. By other similar successive operations they are folded into fours and then into eights. A bundle is thus obtained, which is taken to the shears and cut to the desired dimensions; finally, the eight sheets are separated with the aid of a sword bayonet. When the cooled sheets do not separate it is due to the iron being of a bad quality. The crude sheets thus obtained are put into rectangular cast-iron boxes furnished with a covering. These boxes are introduced into the lower part

of the annealing furnace, and after a sufficiently long exposure to heat the sheet is withdrawn from the boxes and put to cool. The object of this operation is to take away the traces of the cold hammering. The sheets are then passed under a series of cylinders of polished steel, where they are brightened, and they are the black sheets placed on the market.

The Preparation of the Sheets for the Tinning Process.—The sheets are dipped into large tubs containing water and sulphuric acid. Hydrochloric acid or nitric acid may also be used. At Hennebont from 5000 to 6000 kg. of sulphuric acid are used per day. The sheets are put to harden in the acid bath for some minutes and are then passed to the plating department. Formerly, when the sheets were not so well prepared and were made of iron of an inferior quality, the dipping demanded more complicated manipulation. After hardening in the acid the sheets had to be heated in a furnace to a dull red heat, then hammered to remove the oxide, then passed to the hard rolling mill and luviated for 12 hours in water with bran, agitated again in an acid bath, rubbed with oakum and sand, and finally kept in water. At present all these operations are dispensed with. The steeping in acid water and the cleansing are performed rapidly by the aid of steam-power.

The Manufacture of Tin Plates.—The process of plating is the same at Hennebont as elsewhere. The tin bath is composed of equal parts of block tin and alluvial tin, a small quantity of copper being added. With regard to alluvial tin, it is time to recall to mind that the whole coast of Morbihan contains lodes of oxide of tin, but too rare and too much scattered to be worked. The shafts of Piriac, sunk at Castelli, opposite the tomb of Almanzor, have been filled in long ago. But the lodes, corroded by the waves, have produced a stanniferous sand which some people explore even at this day. Tin, if mining operations are well directed, will probably become a source of future wealth for these districts. After dipping the plates pass through a bath of boiling grease, then one of melted tin containing a little chloride of zinc. On coming out of this bath the plate is brushed and subjected to a second plating similar to the first. The plates are then distributed to women, who put them in chopped rice straw and rub them with pads of wool. The tin plate is then finished. Some of the tin plates are put into the market, others are taken to the printing works. This special manufacture of plating gives employment to 160 work-people, men, women and children, divided into 19 plating yards, producing from 500 to 600 boxes of tin plates per day. Two furnaces for refining tin and one for annealing the tin ashes are included in the yards of the plating works.

The Decoration and Stamping of Tin Plates.—This manufacture, carried on at the works since 1868, is of great service to the manufacturers of preserved foods for ornamenting their boxes. Ten improved mechanical presses enable the lithographer to do the writing and the design on the spot upon the stone, which considerably shortens the work. The factory employs for this purpose draftsmen, compositors, lithographers, writers, &c.

In concluding the description of the works it may be mentioned that there is a fitting-shop containing a planing machine, punching machines, vises and slide lathes for repairs. There are also engines for driving the rolling mills, a saw mill, where there are made from 3000 to 4000 wood boxes for packing the tin plates, a carpenters' and joiners' workshop for the manufacture of machine models, a gasworks for lighting the factory, which is kept going night and day, and a shop for cutting the iron and manufacturing

frying pans. Some years ago there were also seven furnaces for enameling tin plates, but this industry has been abandoned. It may be added that the forges of Lockrist, situated a little above the Hennebont works, and employing about 200 workpeople, also roll the iron and assist in the manufacture of the tin plates. But they are relatively of little importance.

The Position of Sugar.

The position of sugar generally is a peculiar one at present, and it is particularly so at New York. Last year's beet-root sugar crop on the Continent of Europe, now being marketed, was unprecedentedly large—3,495,000 tons, as compared with 2,753,844 in 1888, 2,451,950 in 1887, 2,730,206 in 1886 and 2,219,973 in 1885, there being an increase of over 1,000,000 tons in two years. On the other hand, the Cuban crop has latterly suffered from drought and frequent and extensive cane-field fires, and will not come up to the sanguine expectations of planters a couple of months since by a great deal. The remaining cane-sugar producing countries maintain their standard of value higher than the abundance of beet sugar in Europe warrants, because the high prices of last year spoiled the planters, and they cannot yet fully realize that times have changed. Hence it has been extremely difficult in those countries to buy for either the United States or Europe for a month or two past, and the consequence is that in England, for example, the quantity of cane sugar afloat and in stock is at present very moderate, and on the Continent reduced to a minimum. Supplies in Europe are being drawn on all sides from beet-root sugar producers. On this side of the water the trade are practically living from hand to mouth, relying on the daily receipts either of beet-root from Europe or cane from Cuba and the West Indies generally and comparatively small quantities from Brazil. In spite of the unprecedentedly reduced stock at New York, Boston, Philadelphia and Baltimore of 2364 tons of raw sugar on February 6, against 37,639 same date 1889, 64,532 in 1888 and 92,666 in 1887, the price of cane sugar cannot be called high, for it is 5½ cents for fair refining Cuba, against an average price of 5.69 cents for the year 1889. But then the market for refined is unsettled and depressed and reacts on raw.

Claus Spreckels is understood to have finally and definitely thrown down the gauntlet to the Sugar Trust. According to reports which come from authoritative sources the negotiations that have been in progress between Spreckels and the magnates of the trust have fallen through, and Spreckels has announced his determination "to paddle his own canoe." These negotiations had for their purpose what would really have amounted to a quiet working arrangement between the Spreckels and trust refineries. There were meetings in Boston and New York for the purpose of discussing the matter, and it was on the well-circulated reports of the success of the propositions that the price of the Sugar Trust certificates was recently run up from 50 to 65 in a few days. The Standard Oil people, who had been large buyers at the lower figures, were keen enough to act upon their impression that Mr. Spreckels, in a matter of this kind, was an extremely uncertain factor, and they disposed of their holdings all the way up.

The daily capacity of production of the Trust refineries is at present 32,150 barrels, of the independent refineries, 9000. A new refinery is being constructed in Baltimore, with a capacity of 1300 barrels, which will be completed and ready to work next autumn. The new sugar houses of the Havemeyer Sugar Refining Company, which are now being built in Brook-

lyn, will probably have a capacity of 3500 barrels. Sugar consumption in the United States hardly fell off at all in 1889 despite the high prices early in the summer and the indifferently abundant fruit crop on this coast in consequence of excessive moisture. Sugar consumption in the United States the past ten years and the average price of fair refining Cuba in New York have been as follows:

Sugar Consumption and Prices.

Year.	Tons.	Cents per pound.	Year.	Tons.	Cents per pound.
1880....	1,322,908	5.69	1884....	1,265,283	5.29
1888....	1,469,997	5.05	1883....	1,164,391	6.79
1887....	1,397,356	4.70	1882....	1,070,920	7.29
1886....	1,389,079	4.85	1881....	1,008,932	7.62
1885....	1,245,574	5.18	1880....	997,109	7.88
Total..	5,924,914	Total..	5,506,635

This shows an increase of 1,418,279 tons in the last five years as compared with the period of 1880 to 1884, inclusive. This increase amounts to 25 per cent. The consumption per capita of the population in Europe and America is as follows:

1888.	Pounds.
England.....	73
Germany.....	21
France.....	28
Switzerland.....	24
United States.....	53

Louisiana and neighboring States produced last year 153,900 tons as compared with 167,814 tons the year previous. There were 133,384 acres of cane ground in 1889, being 3000 acres increase as compared with the previous year. Planters using modern machinery and appliances obtained an average of 2742 pounds of sugar per acre; those clinging to old methods only secured 2113 pounds.

Sugar consumption has been liberal on both sides of the Atlantic last year, fostered by the healthy condition of general business. As in this respect the outlook for the spring is again of the most reassuring kind, it is safe to presume the coming campaign will again be a lively one, and makers of sugar machinery in this country will have a good season.

The Southern Railway and Steamship Association has under date of February 8 issued a new pig-iron tariff, which goes into effect on the 15th inst. The figures to the leading points are:

	Birming- ham.	Chatta- nooga.	Shef- field.	An- niston.
Chicago....	\$4.40	\$4.15	\$4.15	\$4.65
Cincinnati..	3.15	2.65	2.90	3.15
Cleveland...	4.40	3.90	4.15	4.40
Columbus...	3.90	3.40	3.65	3.90
E. St. Louis.	3.65	3.40	3.20	3.65
Kansas City.	5.89	5.89	5.44	5.89
Louisville...	2.90	2.65	2.65	3.15
Milwaukee...	4.80	4.55	4.55	5.05
Pittsburgh...	4.80	4.30	4.55	4.80

These rates, which are less than required by the present price of pig iron, are a temporary reduction made by the agreement of the railroad companies interested in the traffic, to remain in effect until March 15, 1890.

A press dispatch from Cleveland, Ohio, under date of the 6th inst., says: "The Cleveland Iron Mining Company have bought seven-tenths of the stock of the Ironcliff Company, who own 53,000 acres of iron land near Marquette, Mich. The price paid was \$1,750,000 in cash. The purchasers are well known in mining circles and invested as follows: J. H. Wade, \$400,000; Selah Chamberlain, \$300,000; Samuel Mather and W. L. Mather, jointly, \$300,000; George Howe, \$120,000; T. P. Hardy, \$50,000, and J. V. Painter, \$25,000. There are other large investors."

Two steamship lines are being fitted with refrigerating apparatus at Baltimore to transfer dressed beef to Europe on a large scale.

TRADE REPORT.

Chicago.

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, February 10, 1890.

Pig Iron.—Business in this line continues about as reported last week. The demand is fair for small lots, with an occasional sale of 300 to 500 tons. Prices are so well maintained, despite the appearance from time to time of outside lots, that apprehensions of a decline have almost disappeared. The nearer spring approaches the better the situation becomes for the producers, as time contracts are rapidly being filled, and renewals will then be the order of the day. In some directions a bullish sentiment is even being developed, in sharp contrast with the weak feeling so prevalent in January. Sellers of Lake Superior Charcoal are particularly buoyant and hopeful, as an unusual proportion of their expected output has been sold. It would not be surprising to see a decided advance in this class of metal. Agents for Southern Iron are being held up closely to the price agreed upon some time since, orders being permitted to go by which would have been secured by a small concession; less than 25¢ in some cases. As long as such firmness is shown in that direction the buyers who are holding off to await a break in prices will be disappointed. Makers' quotations are as follows, f.o.b. Chicago, for cash:

Lake Superior Charcoal,	\$23.00 @ \$23.50
Local Coke Foundry, No. 1,	19.50 @ 20.50
Local Coke Foundry, No. 2,	19.00 @ 20.00
Local Coke Foundry, No. 3,	18.00 @ 19.00
Am. Scotch (Strong Soft), No. 1,	21.25 @ 22.00
Ohio Silveries, No. 1,	19.75 @ 20.00
Southern Coke, No. 1,	20.75 @
Southern Coke, No. 2,	20.25 @
Southern Coke, No. 3,	19.75 @
Tennessee Charcoal, No. 1,	22.00 @ 22.50
Alabama Car-Wheel,	26.00 @ 27.00
Bessemer,	24.00 @

Bar Iron.—The local mills are getting pretty well filled up, and the market is consequently very steady at 1.85¢ @ 1.90¢, half extras, f.o.b. Chicago, for Common Iron. More car orders are coming forward, and the prospects are good for much more business in the near future. Store prices for small lots still continue at 2.10¢ @ 2.20¢, according to quantity.

Structural Iron.—A contract for a large hotel was recently placed, which will require \$125,000 worth of Beams and Columns. A peculiarity of this contract is that it emphasizes the change taking place in architectural work to which reference has previously been made in these reports. The columns will be of Steel instead of Cast Iron, thus diverting an important amount of work from the architectural foundries to the Steel mills. As this entire contract was taken by a Beam manufacturer at a lower price than foundrymen could fill it, using cast columns, it is intimated that a way has thus been devised to sell Beams without cutting the prices fixed by the combination.

Plates, Tubes, &c.—Trade has been heavy in this branch. Numerous orders have been booked for small lots, while mill orders were by no means rare. No change is noted in Steel Plates and Sheets, but manufacturers of Iron products have shown more anxiety for business and in some instances named quite low prices. Carload lots from mill are quoted at 2.65¢ for Tank Iron; 2.90¢ for Tank Steel; 2.80¢ for Nos. 10 to 14 Iron Sheets, and 3¢ for Steel do., f.o.b., Chicago. Store prices are as follows: Nos. 10 to 14 Iron Sheets, 2.90¢; No. 16 do., 3¢; No. 18, 3.25¢; Nos. 10 to 14 Steel Sheets, 3¢ @ 3.25¢; No. 16 do., 3.50¢ @ 3.75¢; No. 18 do., 3.75¢ @ 4¢; Tank Iron, 2.75¢ @ 2.80¢; Tank Steel, 3¢ @ 3.10¢; Shell Iron and Steel, 3.25¢; Flange Steel, 3.50¢; Fire-Box, 4.25¢ @

5.50¢; Boiler Rivets, 4¢ @ 4.25¢; Norway Rivets, 40 ¢; Boiler Tubes, 1½ inches and smaller, 45 ¢; 2 to 4 inch, 50 ¢; 4-inch and larger, 52½ ¢.

Sheet Iron.—The situation in Black Sheets of thin gauges is a trifle mixed. Heavy buyers have been trying to place orders for their summer requirements, but are unable to find a manufacturer willing to quote on deliveries beyond May. The possibility of a prolonged dispute over wages for next year is the reason assigned. On deliveries earlier than May, however, some weakness has developed, manufacturers competing vigorously for orders now in the market. No. 27 Common is quoted at 3.25¢ @ 3.30¢, Chicago, in large lots from mill, and at 3.40¢ to 3.50¢ from store.

Galvanized Iron.—Jobbers report an increasing inquiry from their trade, some customers expecting to require an unusually heavy supply. Manufacturers' agents are making better deliveries than some time since, but most of them report mill prices very firm. Small lots of Juniata are quoted at 59 and 10 ¢ to 60 ¢ off.

Merchant Steel.—More figuring is being done on large lots than for some time past, and a brisk business is looked for shortly. Some manufacturers overreached themselves in taking season contracts, and their customers are obliged to search about sharply to secure a sufficient supply to meet their necessities. Carload lots of Open Hearth Machinery are still quoted at 2.75¢ @ 2.85¢, Chicago; Toe-Calk, 2.75¢ @ 2.85¢; Spring, 2.75¢ @ 2.90¢. Small lots of Tire are sold at 2.50¢ @ 2.65¢ from store; Bessemer Bars, 2.50¢ rates; Open-Hearth Machinery, Toe-Calk and Spring, 3¢ @ 3.25¢; Tool, 7½¢ and upward; Crucible Sheets, 7¢ @ 10¢.

Steel Rails and Fastenings.—Probably 20,000 tons of Steel Rails were sold during the past week, but inquiries are still somewhat slow. Mills quote \$38 for ordinary business. Orders for Fastenings are more numerous than for Rails, the roads which bought their Rails last fall now coming into the market for Splice-Bars, &c. One order calls for 40,000 Splice-Bars. Mills quote as follows: Iron Splice-Bars, 1.90¢ @ 2¢; Spikes, 2.25¢ @ 2.30¢; Square-Nut Bolts, 2.80¢ @ 2.85¢; Hexagon do., 2.95¢ @ 3¢.

Old Rails and Wheels.—Old Iron Rails have gone off materially. Sales were made during the week at \$25.50 for a small lot, \$25 for several good-sized lots and \$24.50 for 500 tons at the close. Old Steel Rails keep up in marked contrast and are in good demand at \$20 @ \$20.50 for short pieces and \$21.50 @ \$21.75 for long lengths. Old Car-Wheels are quiet and nominally worth \$19.75 @ \$20, but higher prices and a better demand are looked for when low-priced Charcoal Iron contracts begin to run out, which is predicted to occur soon.

Scrap.—An abundance of high-grade Scrap is still being offered, with very few buyers in the market. No. 1 Forge is especially plentiful. Cheap stock, however keeps up well, the demand and supply being about equal. Dealers quote selling prices as follows. Per ton of 2000 lb: No. 1 Forge, \$19 @ \$19.50; No. 1 Mill, \$16.50; Nos. 2 and 3 Mill, \$11; Horse-shoes, \$19; Old Axles, \$25; Pipes and Flues, \$15; Cast Borings, \$10; Wrought Turnings, \$14; Axle Turnings, \$15; Stove Plate, \$11; Machinery Cast, \$13.50; Mixed Steel, \$15.50; Coil Steel, \$17; Leaf Steel, \$18; Tires, \$18 @ \$18.50.

General Hardware.—The demand for both Shelf and Heavy Hardware has been very good during the past week, notwithstanding the bad condition of the country roads. Collections are as good as usual. No special changes have taken place in prices.

Nails.—Jobbers report that about two-thirds of their Nail sales at present consist of Wire Nails, the demand for them coming from sections in which the Cut Nail had retained its supremacy with every prospect of thus continuing. The consequence of this is very naturally a degree of weakness in Cut Nails and a corresponding stiffness in Wire Nails. Reports are current of concessions being offered by Cut Steel Nail manufacturers, who have grown tired of maintaining rates at \$2.50 at mill and receiving no orders. Probably \$2.50, Chicago, is now a fair price for large orders from factory. Jobbers still quote \$2.70 for Cut Steel Nails, but this price is being shaded when Hardware orders can be secured by such a concession. Wire Nails, however, are quite strong at \$3.15 from store, with 5¢ off for carload lots.

Barb Wire.—At a meeting of manufacturers and jobbers held in this city on the 5th inst. the price of small lots of Painted was advanced again to 3.45¢ and carload lots to 3.35¢. It is expected that the advance will hold this time, as the condition of the trade warrants it. In fact, the belief is quite prevalent that prices will be still higher by March. Galvanized Barb Wire maintains its usual advance of 60¢ per 100 lb on Painted.

Philadelphia.

Office of *The Iron Age*, 230 South Fourth St., PHILADELPHIA, Pa., February 11, 1890.

The market has changed so little within the past three or four weeks that almost any of our reports since the middle of January would correctly represent the market to-day. Of course every day's delay brings the turning point so much nearer, but it is as hard to predicate the course of the market to-day as at any time within the past three months. If the demand during the past six weeks is a trustworthy guide, we should say that prices are likely to be lower, while if the quantity of Iron offered was the true criterion, an entirely opposite view would be taken. For the present, therefore, it may be assumed that supply and demand are pretty evenly balanced, and that the deadlock is due to the fact that everybody bought before the rise, and that the Iron then bought is now being delivered and consumed. Some new business has been done, of course, but in no great quantities, so that the question of prices is in a measure still unsettled. The extreme figures quoted during December have not been maintained, prices of both Mill and Foundry Irons being about 50¢ lower, with no general disposition to renew large contracts even at still further concessions, which, however, are not generally offered. Sellers appear to be almost equally indifferent, and while somewhat anxious to secure new business, they regard current quotations quite as low as the conditions warrant, and in view of the increase in the price of Coke, the high cost of Ores and other prospective advances, it is difficult, if not impossible, to find any one willing to make contracts at less than to-day's prices, although a few lots for "prompt cash on delivery" may be picked up occasionally. There are always some lots for sale on special terms, but as regards standard brands, the market appears to have a decidedly firm undertone, notwithstanding the dullness. A movement must set in shortly, from one side or the other, and the ultimate course of the market will doubtless depend upon who takes the first step. If it is the buyer, the presumption will be that his requirements are likely to be immediate, and that his stocks are pretty well exhausted. If it is the seller, the presumption will be that having finished the old contracts he has no immediate prospect of a market, and is feeling his way so as to avoid accumulation. At present

it is a complete stand off with no apparent advantage on either side. The general impression in the trade is that there will not be much change either way. There are some indications of a better demand in the near future, but this is offset by new furnaces "blowing in," as well as by some little easing up in the West, so that on the whole it is still a waiting market. Business during the week has been done on a basis of from \$17.50 to \$18, delivered, for Gray Forge, \$18.75 to \$19 for No. 2, and \$19.50 to \$20.50 for No. 1, according to quantity, quality, &c.

Bessemer Pig.—There is no demand of any importance and prices are nominally \$21.50 @ \$22, at furnace, but without actual business so far as we can learn, although it is thought that \$21 would be paid for 1000-ton lots and upward.

Spiegeleisen.—The market is unsettled and lower. The usual asking price is \$37.50 for 20 %, but sales were made during the week at about \$36, c.i.f., duty paid, Jersey City. Ferro is quoted at \$95 @ \$98 for 80 %, with sale at \$108 for small lot, spot delivery.

Steel Rails.—The market has not taken on much animation as yet, but prices are held at \$35 @ \$35.50, at mill. Negotiations are in progress which may lead to important business in the near future, but in the meantime small lots are about all that are called for at quoted rates. Mills are all busy, however, although there are some indications of weakness, said to be due to resales of lots bought last fall.

Billets.—Prices are irregular and on the whole somewhat inclined to weakness. Asking prices are nominally \$37 @ \$37.50, delivered, for Billets, and about \$1 less for Nail Slabs.

Blooms.—Prices are steady at about \$52 @ \$53 "Bloom ton" for Hot-Blast Charcoal, and \$54 @ \$55, delivered, for Cold-Blast. Run-out Anthracite, \$44 @ \$45, and Scrap Blooms, \$35 @ \$36, delivered in consumers' yards.

Muck Bars.—There is very little doing, and to effect sales sellers would have to make concessions. The offerings are not large, and as yet \$31.75 @ \$32, at mill, seems to be as low as any one would accept for good Bars, but no business has been reported recently. Our last week's report should have read \$32, at mill, but owing to a typographical error it was made \$33, which was the price delivered in consumers' yards.

Bar Iron.—The market shows very little change, and in all leading features is about the same as a week ago. There is no snap to the demand, and although manufacturers are getting anxious for business, they are not in a position to quote lower prices, as cost of production is said to be well up to quoted rates. It is reported that there are inquiries on the market for about 5000 tons of Car Iron, but as yet we cannot find that any important orders have been taken. City mills are quoting 1.95¢ @ 2¢; country mill 1/16¢ less, while in some cases it is probable that still further concessions could be had on the right kind of an order. The feeling is a little unsettled, although some parties appear to be very confident of a better market in the near future.

Skelp Iron.—The market has not shown much activity during the week, although a few sales are reported at 1.95¢ @ 2¢ for Grooved, and about 2.10¢ for Sheared.

Plates.—Business is still dull and disappointing to manufacturers, although it is said that there is an abundance of work in sight. Meanwhile orders for immediate delivery would be taken at concessions, as some of the mills are delayed on account of not receiving specifications on old con-

tracts, although these may come in at any moment and again cause another crowding up at the mills. At present, however, things are very dull, and prices a little inclined to droop, although they are nominally the same as last week, viz.:

	Iron.	Steel.
Tank.....	2.30 @ 2.25¢	2.65¢ @ 2.75
Shell.....	2.65¢	3.00¢ @ 3.10
Flange.....	3.25¢	3.25¢ @ 3.35
Fire-Box.....	3.75¢	3.75¢ @ 4.25
Angles.....	2.30¢	2.75¢ @

Structural Material.—There is some business doing, but not enough to cause any great activity. The demand from week to week is about equal to the deliveries, so that the amount of orders on hand, which is very considerable, is not appreciably decreased. Prospects are considered to be satisfactory, and although prices are nominally unchanged, Angles and Bridge Plates can be shaded for desirable specifications. Quotations about as follows: 2.35¢ @ 2.40¢, delivered, for Iron Bridge Plate; 2.30¢ @ 2.35¢ for Angles, with 20¢ @ 25¢ more for the same in Steel. Tees, 2.8¢ @ 2.9¢; Beams and Channels, 3.1¢ for either Iron or Steel.

Sheet Iron.—There is a fair demand, and mills are running full without accumulating much stock. Prices steady and unchanged, and for carload lots are quoted as follows:

Best Refined, Nos. 14 to 20.....	3.10¢
Best Refined, Nos. 21 to 24.....	3.30¢
Best Refined, Nos. 25 to 26.....	3.50¢
Best Refined, No. 27.....	3.60¢
Best Refined No. 28.....	3.70¢
Common, 1/4¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3 1/4¢
Best Soft Steel, Nos. 21 to 24.....	3 3/4¢
Best Soft Steel, Nos. 25 to 26.....	3 1/2¢
Best Soft Steel, No. 27.....	4 1/4¢
Best Bloom Sheets, 1-10¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	.60 %
Common, discount.....	.62 1/2 %

Old Rails.—The dullness has at last resulted in a lower range of quotations. A sale of 2000 tons D. H.'s for shipment was made at \$27.50, while a cargo of T's, about due in New York, attracts no bids at anything near the rates recently quoted. Small lots sell at \$27.50 @ \$28, delivered to mills in the interior, while \$28 @ \$29 is asked for lots in store, but there is very little disposition to make offers in the present condition of the market.

Scrap Iron.—The market is dull, with prices weak and irregular. Some very low prices are reported, but in ordinary cases prices are about as follows: No. 1 Wrought, \$23.50 @ \$24.50, Philadelphia, or for deliveries at mills in the interior \$25 @ \$26; \$16 @ \$17 for best Machinery Scrap, \$15 @ \$15.50 for ordinary, \$16.50 @ \$17 for Wrought Turnings, \$11 @ \$11.50 for Cast Borings, and \$28 @ \$30 for Old Fish-Plates, and \$18 @ \$19 for Old Car-Wheels.

Nails.—The market is dull, but there is no disposition to crowd sales in the present condition of the market. Prices are about 2.10¢ for carload lots and 2.20¢ from store, but only small sales are reported.

Wrought-Iron Pipe.—There is a continued good demand, and prices are firmly maintained. Discounts are quoted as follows: Butt-Welded Black, 47 1/2 %; Butt-Welded Galvanized, 40 %; Lap-Welded Galvanized, 47 1/2 %; Lap-Welded Black, 60 %; Boiler Tubes, 1 1/2 inches and smaller, 45 %; Boiler Tubes, 2 to 4 inches, 50 %; Boiler Tubes, 4 1/2 inches and larger, 52 1/2 %; Oil Well Casing, 52 1/2 %.

The contract for furnishing steel boiler plates for certain naval vessels has been awarded to the Linden Steel Company at their bid of \$20,860 for the plain plates. The bid of the Richmond Locomotive and Machine Works to furnish these plates flanged and finished for \$81,200 was re-

jected as excessive. Under the present contract the plates will have to be trimmed and flanged by the government.

Louisville.

LOUISVILLE, KY., February 10, 1890.

Pig Iron.—The market is showing some activity and inquiries are coming in more freely than at any time during the last six weeks. Some manufacturers find that they have sold their finished product to an extent that makes it wise to buy for future delivery to cover sales made. It looks as if the dullness which has existed since the middle of December would soon pass away and that buyers would purchase more freely without fear of any serious decline. It is believed that during the spring prices will advance again, and that before the close of the year the market will show a much higher range of values.

Southern Coke, No. 1 Foundry (new classification).....	\$18.75 @ \$19.25
Southern Coke, No. 2 Foundry (new classification).....	18.25 @ 18.75
Southern Coke, No. 3 Foundry (new classification).....	17.75 @ 18.25
Gray Forge.....	17.25 @ 17.75
White and Mottled, different grades.....	16.00 @ 17.00
Silver Gray, different grades.....	16.75 @ 17.75
Southern Charcoal, No. 1 Foundry.....	18.75 @ 19.75
Southern Charcoal, No. 1 Mill.....	17.50 @ 18.00
Southern Car-Wheel, standard brands.....	23.50 @ 24.50
Southern Car-Wheel, other brands.....	19.25 @ 21.75
Hanging Rock Coke, No. 1 Foundry.....	18.75 @ 19.25
Hanging Rock Charcoal, No. 1 Foundry.....	22.00 @ 22.50
Hanging Rock, Cold Blast.....	24.00 @ 26.00

Cincinnati.

Office of The Iron Age, Fourth and Main Sts. CINCINNATI, February 10, 1890.

Pig Iron.—A new factor has entered the local market for Pig Iron, being a reduction in freight rates from the furnaces in the South to Northern points. The reduction is to be effective on the 15th inst. and makes a difference of 30¢ per ton in the cost of Iron at Cincinnati, purchased at Birmingham, Ala. Otherwise there has been nothing of importance in the local market upon which to dwell. Producers have remained strong, believing themselves well fortified by statistics, and reasoning that buyers will soon be compelled to enter the market. But consumers have shown themselves strong enough to withstand purchasing, although they have made more particular inquiries regarding the outlook. The entrance of the transportation companies, however, as a virtual arbitrator, to adjust the differences of buyer and seller, will doubtless restore the market to a more healthful activity. The furnaces have conceded 10¢ @ 15¢ per ton in a number of instances, and this added to the reduction of 30¢ in freight rate will about eliminate the bone of contention in the market, and furnaces and consumers alike may congratulate themselves in having maintained their respective positions. Only small sales of Iron have been made during the week of both Southern and Northern grades and prices are nominally unchanged. Several moderate amounts of Iron in second hands have been closed out at about 50¢ per ton below the market established by furnaces. The following are the approximate rates current here at the close, cash, f.o.b. Cincinnati, but Southern turnaces continue to demand 45¢ more than outside quotations:

Foundry.

Southern Coke, No. 1.....	\$18.50 @ \$19.00
Southern Coke, No. 2.....	18.00 @ 18.50
Southern Coke, No. 3.....	17.50 @ 18.00
Ohio Soft Stone Coal, No. 1.....	18.50 @ 19.00
Ohio Soft Stone Coal, No. 2.....	17.50 @ 18.50
Mahoning and Shenango Valley.....	18.00 @ 18.50
Hanging Rock Charcoal, No. 1.....	21.00 @ 23.00
Hanging Rock Charcoal, No. 2.....	20.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1.....	19.50 @ 20.00
Tennessee and Alabama Charcoal, No. 2.....	18.50 @ 19.00

Forge.

Gray Forge.....	17.00 @	17.50
Mottled Neutral Coke.....	16.75 @	17.25
<i>Car-Wheel and Malleable Irons.</i>		
Southern Car-Wheel.....	24.00 @	24.50
Hanging Rock, Cold Blast.....	22.00 @	25.00
Lake Superior Car-Wheel and Malleable.....	23.00 @	25.00

Manufactured Iron.—There has been a moderate demand and a steady market for Manufactured Iron without new features. New contracts are not as frequent as is regarded as desirable by the mills, but old orders still furnish some animation.

Nails.—There has been a good demand and a firm market for Steel, while Iron Nails have continued dull. Steel Nails, 12d to 40d, sell at \$2.70 @ \$2.75 per keg, with 10¢ rebate in car lots, at mill; 50d to 60d at 25¢; 10d, 10¢; 8d and 9d, 25¢; 6d and 7d, 40¢; 4d and 5d, 60¢; 3d, \$1, and 2d, \$1.50 per keg more; Steel Wire Nails sell at \$3.10 @ \$3.20 for 60d.

Old Material.—There has been scarcely any demand for Wheels during the week and only a moderate inquiry for Old Nails. The latter are quotable at \$26.50 @ \$27.50, according to location, and Old Wheels are nominally quotable at \$19 @ \$19.50, cash.

Cleveland.

CLEVELAND, February 10, 1890.

Iron Ore.—Steel manufacturers east of the Alleghenies are demanding Bessemer Ore even if advanced prices must be charged. Orders are being received for lots of from 10,000 to 50,000 tons, but only a very few sales are reported and these were for very small lots. Non-Bessemer are selling freely at prices slightly in advance perhaps of quotations prevailing several weeks ago. More attention is being given, however, to the work of engaging transportation for next season and charters for carrying at least 100,000 tons of ore have been made during the past week at long prevailing prices. Following are cash quotations:

No. 1 Specular and Magnetic Bessemer Ores, Bessemer quality.....	\$6.50 @	\$7.25
No. 1 Specular and Magnetic Ores, Non-Bessemer quality.....	5.50 @	6.25
Red Hematite Ores, Bessemer quality.....	@	6.00
Red Hematite Ores, Non-Bessemer quality.....	4.50 @	5.00
Menominee Range Ores, Bessemer quality.....	5.50 @	6.25
Menominee Range Ores, Non-Bessemer quality.....	4.25 @	5.00
Gogebie Range Ores, Bessemer quality.....	5.25 @	6.25

Pig Iron.—The market is more active, but prices are less firm, a condition, however, that is viewed complacently by the furnacemen. Sales of lots varying in amount from 1000 to 5000 tons are reported at \$22.50 @ \$23.50, cash, at the valley furnaces. Owing to the unsettled condition of the Coke Market prices are not generally given on Foundry and Mill Irons. Producers refuse to sell large quantities of Iron for long future delivery, and this is regarded as proof of their belief in the early improvement of the market. Following are cash quotations:

Nos. 1 to 6 Lake Superior Charcoal.....	\$22.20 @	\$23.50
No. 1, 2 and 3 Bessemer, per ton.....	@	24.00
No. 1 Strong Foundry, per ton.....	19.80 @	20.80
No. 2 Strong Foundry, per ton.....	18.80 @	19.80
No. 1 American Scotch, per ton.....	19.30 @	20.30
No. 2 American Scotch, per ton.....	18.30 @	19.30
No. 1 Soft Silvery, per ton.....	18.50 @	19.50
Mahoning and Shenango Valley Neutral Mill Irons, per ton.....	18.30 @	19.30
Mahoning and Shenango Valley Red Short Mill, per ton.....	19.30 @	20.30

Scrap Iron.—The market is inactive, dealers being unwilling to pay \$27 for Old Americans. Old Wheels are dull at \$19, but Wrought Scrap is eagerly taken.

Manufactured Iron.—The demand for Common Bar at 2¢ is increasing, but Sheets are as scarce as ever.

St. Louis.OFFICE OF *The Iron Age*, 214 N. Sixth st., St. Louis, February 10, 1890.

Pig Iron.—Dullness continues to reign in this department and with one or two exceptions agents report business as being almost lifeless. There are, however, a number of encouraging inquiries being received, which indicate an improved trade later on. It is generally believed that the speculative element have sold out their holdings at a fair profit, and it is hardly probable that they will again touch the market, at least not at the present figures. With this class of custom well out of the way the hope for early improvement in the market is somewhat better than it has been at any time since the beginning of the year. Furnaces have instructed their agents not to cut prices under any circumstances. With these facts in view, and the increased demand which usually sets in about this time of the year, the outlook is considered to be of an encouraging nature. In the absence of sales prices are nominally as follows:

Southern Coke, No. 1 Foundry.....	\$19.50 @	\$20.00
Southern Coke, No. 2 Foundry.....	18.75 @	19.25
Southern Coke, No. 3 Foundry.....	18.25 @	18.75
Gray Forge.....	17.75 @	18.25
Ohio Softeners.....	20.00 @	21.00
Lake Superior Charcoal.....	24.00 @	24.50

Missouri.

Charcoal Foundry, No. 1.....	21.00 @	21.50
Charcoal Foundry, No. 2.....	20.25 @	20.75

Tennessee.

Charcoal Foundry, No. 1.....	20.00 @	20.50
Charcoal Foundry, No. 2.....	19.25 @	19.75
Connellsville Coke, f.o.b. East St. Louis.....	\$5.25;	St. Louis, \$5.40.

Bar Iron.—Mills are kept well employed and in some cases are pushed to fill orders. Prices remain unchanged, as follows: Lots from mill, 2¢; small lots from store, 2.15¢.

Barb Wire.—Mills report an active trade at the advanced prices, and in some cases are compelled to work double turn to fill orders. The cut in freight rates to Texas points has resulted in a flood of orders from that section, which come in an opportune time, as business is usually flat at this season of the year. Prices are well maintained, as follows: Painted, 3.45¢; Galvanized, 4.05¢. Carload lots 10¢ per cwt. less than above prices.

Rogers, Brown & Meacham, St. Louis, Mo., have been appointed agents for Attalla Furnace, Attalla, Ala. The product of this furnace is a first class Car-Wheel Iron. They have also been appointed agents for Stewart, formerly Gadsden, Furnace, Gadsden, Ala., which also make a Car-Wheel Iron of good quality.

Detroit.

WILLIAM F. JARVIS & Co., under date of February 10, 1890, say: We are unable to report any change in the condition of the Iron market. It is practically a game of endurance between the buyer and seller. There must be within a comparatively short time considerable Iron bought. Many of the furnaces claim that they have orders enough ahead not to bother about taking more for the next 60 days. If this is a fact we think the furnaces will prove the stronger, and that buyers will be forced to take offered figures. At the same time, there are not a few furnaces who are decidedly weak in their position, being anxious to sell at reduced prices from quoted rates. Lake Superior Charcoal is practically where it has been for the last two weeks. The outlook for the maintenance of prices for this grade of metal is better perhaps than for any other on the list. There have been no transactions of any magnitude for a week past,

but a few inquiries for round lots have been received, which may result in having the actual figures of the market defined more clearly. We report prices as follows:

Lake Superior Charcoal, all numbers.....	\$22.50 @	\$23.50
Lake Superior Coke Bessemer.....	23.50 @	24.50
Katahdin (Maine Charcoal).....	26.00 @	26.50
Lake Superior Coke Foundry, all ore.....	20.50 @	21.50
Lake Superior Coke Foundry, cinder mixed.....	20.00 @	20.50
Standard Ohio Blackband.....	20.00 @	21.00
Southern No. 1.....	20.50 @	21.00
Southern Gray Forge.....	19.00 @	19.50
Jackson County (Ohio) Silvery.....	19.50 @	20.00
Old Car-Wheels (nominal).....	21.00 @	22.00

Chattanooga.Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, February 10, 1890.

Pig Iron.—Consumers are more interested in getting prices for large round lots for future delivery, and from all appearances the lethargy that has prevailed for the past two or three weeks is passing away. There is no question that the position of most of the Southern stacks is quite an independent one. Many of them are sold quite largely ahead, and some of them are yet far behind in filling their contracts, and have very little Iron to sell for delivery in the near future. Within the past few days there have been quite a number of offers declined that were made at conceded prices for large lots, two of which were for 10,000 tons No. 3 and one of 5000 tons for No. 2. These conditions may be accounted for partially by the earlier opening of spring, and consumers are realizing the fact that they are going to have more business on their hands than they anticipated and are beginning to fortify themselves accordingly. Some of our producers are talking of prices going up \$1 to \$2 within the next 30 or 60 days, but this is a question that the future only can solve. The railroad lines leading from the Southern producing points to the Ohio River and beyond have reduced the rates of freight 30¢ per ton, to take effect 15th inst. and to remain in effect until the 15th prox. This supersedes the joint rate tariff dated December 20, 1889.

New York.Office of *The Iron Age*, 66 and 68 Duane street, NEW YORK, February 12, 1890.

The market continues in an uncertain condition, and in some lines a downward tendency has developed. This is particularly true of foreign material. The drop in the speculative markets has been reflected to some extent in lower prices for manganiferous material and Old Rails. It is reported, however, that makers' brands of Pig Iron in England have not thus far shown any notable falling off.

American Pig.—The market in the territory tributary to New York is quiet, with prices still to some extent in buyers' favor. The majority of foundries are still getting Iron on old contracts, entered into during the closing months of last year. They have a moderate supply of this cheap Iron, and are not inclined, as matters stand now, to replenish. How some consumers view the situation is illustrated by a recent transaction. A seller gave a buyer the option to take a few hundred tons a month for the balance of the year, either at \$20 for No. 1 for the whole period or at the market price from month to month. The buyer accepted the former proposition. A possible source of trouble may arise from the demands of some of the coal miners in the Birmingham district. We understand that there is some danger of a strike which would affect all the companies except the Tennessee. Should any considerable num-

ber of the Southern furnaces be forced to bank the effect would probably be quickly to bring in the buyers who are now holding off. The situation in the West has been somewhat changed by the lowering of freights by 30¢, while the price of Coke to the furnaces in Western Pennsylvania and Ohio who compete with the Southern furnaces for the Foundry and Forge grades has been raised by 40¢. This would seem to give the Southern furnaces an aggregate advantage of about 75¢ per ton. In other words, the contest is likely to be transferred to the West, which would give some relief to Eastern producers. We continue to quote No. 1 Foundry at tidewater, \$19.50 @ \$20, and No. 2, \$18.50 @ \$19.

Spiegeleisen and Ferromanganese.—There has been a decided drop. In Spiegeleisen a few thousand tons have been sold at private terms. A lot of 6000 tons of Spiegeleisen, May, June and July delivery, has been widely offered at \$36, and Steel mills have been asked to bid \$35, firm, for it. We do not hear that any business has resulted. Ferromanganese, for delivery during the second half of 1890, has been sold at considerably lower prices, and could now be purchased at \$90. For spot, or delivery during March or April, \$95 @ \$92.50 is asked and has been paid during the week.

Manufactured Iron and Steel.—We quote Bars 1.9¢ @ 2¢ for Refined; Iron Universal Mill Plates, 2.30¢ @ 2.40¢; Angles, 2.30¢ @ 2.40¢; Tees, 2.7¢ @ 2.8¢, and Beams and Channels, 3.1¢, on dock.

Merchant Steel.—We quote Ordinary Hot Finish Round Shafting, 2.20¢ @ 2.30¢; small sizes do., 2.35¢ @ 2.40¢; Toe Calk, 2.50¢ @ 2.60¢, and Tire, 2.35¢ @ 2.45¢, at mill.

Steel Nails.—The market is easier, those who have been asking \$36 having receded from their position and intimating that they would close at \$35. Practically no business has been done during the week to test values. Pittsburgh quotes \$35, which would indicate somewhat lower values for the East. It is reported that 17,000 tons have been secured by two Pittsburgh mills for a coal road in Indian Territory. One Canadian order for 10,000 tons is in the market. The American mills will have to compete with English works for the contract.

Wire Rods.—A moderate amount of business is being done, \$54 being quoted at tidewater.

Rail Fastenings.—We quote Angle Bars 2.10¢, delivered, and Spikes \$2.20 @ \$2.25.

Old Rails.—We note a sale of 2000 tons of Double Heads, for shipment, at private terms, to a mill on the Delaware. The Calcutta lot referred to in a recent issue has, it is reported, been taken for the Pacific Coast. American Tees are offered at \$26.50 @ \$27.

Financial.

There is nothing especially exhilarating in the business outlook, and yet the general situation is believed to be sound, and prospects for the spring opening are hopeful. Much significance is attached to the fact that three banks, one of them a national institution, could suddenly suspend without causing more than a ripple in the current of affairs. No better evidence could be afforded of the absence of speculative values and of undue expansion. Unprecedented snow storms on the Pacific Coast, followed by floods, causes some temporary interruption of traffic in that direction. In the South, on the contrary, there are signs of quickening activity, stimulated by pro-

ductive crops and remunerative prices. The eight-day agitation, of which Boston is the center, excites some discussion in industrial circles, particularly the building trades. Among the iron manufacturers there is no hesitation on the part of several leading firms in declaring that the idea is impracticable. Window-glass manufacturers announce an advance, also a glass trust, and there is an advance in the prices of coke. A tool trust is among the latest novelties. The anthracite trade is dull beyond precedent. A reduction in corn freights from Nebraska and Kansas by the railroads is expected to give a fresh impetus to transportation. East-bound shipments last week, 105,529 tons, as against 61,891 the same week last year.

The commerce of the port of New York for January presents several noteworthy features. While the imports reached the extraordinary aggregate of nearly \$44,500,000, or about \$4,000,000 in excess of any other year on record, January, 1889, alone excepted, the exports do not show a corresponding increase, the total at this port having amounted only to \$25,500,000 exclusive of specie, which is nearly \$5,000,000 below the corresponding month last year. Despite this falling off, the exports for the last seven months in the aggregate, exclusive of specie, are \$21,500,000 in excess of the corresponding period of the previous year. When the returns from all the ports shall have come to hand it is probable there will be found little if any balance of trade in favor of the United States.

The stock market was fairly active, but irregular. The advance to 1½ % in the quarterly dividend of the Chicago, Burlington and Quincy caused an advance in all this class of stocks. On Tuesday the market was stagnant and weak at the close. The adjournment of the Interstate Association at Chicago without action caused much disappointment. The resignations from the association of the Union Pacific and Chicago and Northwestern railroads were accepted. News was received that Judge O'Brien had made permanent the injunction restraining the Sugar Trust from disposing of its property pending the decision of the Court of Appeals.

Exports from the port of New York for the week were valued at \$5,708,700; imports, \$9,561,000. Exports of specie were nominal.

The trusts were irregular and feverish. The street regards the proposition to squeeze some of the water out of the Lead Trust as a step in the direction of honest dealings. Reading and Lackawanna received much attention, and on Saturday were the most active of the group. On Monday the most important decline in the local stock market was in Chesapeake and Ohio, the first preferred selling down ¾ to 61, although all classes were affected by the bank statement. Realizing sales caused a fall in Sugar Trust.

United States bonds were weak. Quotations as follows:

U. S. 4½s, 1891, registered	103½
U. S. 4½s, 1891, coupon	104½
U. S. 4s, 1907, registered	123½
U. S. 4s, 1907, coupon	123½
U. S. currency 6s, 1895	116

The weekly bank statement shows a loss in reserve due partly to an expansion of over \$8,000,000 in loans, the loss in cash having been about \$3,800,000, as against a decline in the surplus of \$4,409,550. The main fact, however, is that the banks now have but \$9,858,900 in excess of the 25 % legal requirement. This is the smallest amount held by them at the end of the first week of February since 1883, the present surplus comparing with \$14,153,270 in 1889 and \$20,143,270 in 1888. To what extent the reserves have been affected by the Sixth National Bank *faux pas* is variously conjectured. The Lenox Hill re-

sumed on Friday, in charge of President Jordan, of the Western National, and a new board of directors. Vice-president Canda, of the Western National sent out a circular, explaining the bank's relations with the recently suspended banks. The Western National, it says, was clearing for the Equitable, but had notified the Equitable to take away its account. The Equitable asked for time and put up 300 shares of Sixth National stock as security. When the Sixth National suspended additional security was demanded and furnished by the president and some of the directors of the Equitable. The Sixth National afterward paid the balance due the Western National, and the latter lost nothing. The would-be president of the Sixth National, Peter J. Claassen, and Chas. H. Leland, the present head of the bank, are being examined before the United States commissioner, the former as a prisoner. Public confidence has not been disturbed by these transactions, indicating the general soundness of the financial situation. Time money has been in good supply from local and outside institutions and the demand is less urgent. On prime collateral the rate is 3½ %, 60 @ 90 days, and 4½ % @ 5½ % for longer dates. The demand for commercial paper was not brisk. Quotations were 4½ % @ 5 % for 60 to 90 days' indorsed bills receivable.

Business in general merchandise seems very light. The dullness and depression in the flour trade is almost without precedent, the lowest prices named by Western millers failing to excite export inquiry. Corn and oats are weak and lower on reduced freight rates West. Cotton is active and 1½ ¢ higher on quotations for spots, based on reduced crop estimates by the Agricultural Bureau. In provisions spot trade is light. Nevertheless, exports from all the Atlantic ports for the week were heavy, comprising 11,500,000 lb of lard and 14,000,000 lb of bacon. Dry goods jobbers report a conservative demand, but improved, and accounts from the South are very encouraging. A Boston report says business in rubber goods is very dull and unsatisfactory. A number of the factories are closed down entirely and the remainder are only running on an average of about half-time. Coffee moves slowly. Sugar is steady. For refined lower prices result from Spreckels' competition.

Metal Market.

Copper.—The tendency toward a lower ruling which so far this month has seized upon nearly all metals on both sides of the Atlantic, including Copper, has made further headway in London, where spot, which stood £48. 17/6 when we last reported, has given way to £46. 17/6, while futures declined from £49. 10/ to £47. 10/; sales aggregating 2500 tons. Our own market has remained devoid of actual business except in a small way from second hands at 14½ ¢ for Lake, casting brands going at 12½ ¢ @ 12¾ ¢. The actual export of Copper from Chili last year did not exceed 27,325 tons Fine, against 34,384 in 1888, 33,778 in 1887, 39,055 in 1886, 43,793 in 1885 and 49,882 in 1884. It really looks as though the growing scarcity of miners in the Chilean Copper region were becoming a serious affair, for there are no indications from there that the mines are becoming exhausted. If this were the case Europeans would not now buy so many mines out there and pay big prices for them. The January import of American Copper into Liverpool and South Wales has been 2387 tons Fine, against 2778 in 1889 and 2529 in 1888.

Tin.—At the time of our last week's report spot Tin still commanded £93. 5/ in the London market, while to-day it is only worth £91. 2/6, futures dropping from £93. 15/ to £92; sales summing up 1500

tons. Here great activity was displayed at rapidly drooping figures, landing spot to-day at 20½, after sales of together 600 tons. At the Metal Exchange, before the first call 25 tons April Tin was sold at 20.25¢. **Tin Plates**—Have been flat and ill-sustained. We reduce quotations to the following, per box: Siemens-Martin Steel, Charcoal finish, \$5.50 @ \$5.75; Coke finish, \$5.20 @ \$5.25; Coke Tins, Penlan grade, \$4.50 @ \$4.55; J. B. grade, \$4.65 @ \$4.70, and Wasters, \$4.50.

Lead.—Sales for the week in the open market amounted to 500 tons, the bulk at 3.82½¢ and some at 3.80¢, the winding up quotation being 3.80¢ @ 3.82½¢. St. Louis has been fairly active at 3.60¢ and Chicago quite so at 3.65¢ @ 3.67½¢.

Spelter—Is becoming weaker and weaker. Some 100 tons were sold here at 5.35¢ down to 5.25¢, the inside figure being the established one at the close. Out West 5.10¢ is the price asked at present. Silesian declined in London from £23 to £21. 5/. We quote 6½¢ here.

Antimony.—There has been a fair demand, while the stock is light. We quote Cooksons's 30¢ and Hallett's 20½¢.

New York Metal Exchange.

The following sales are reported:

THURSDAY, February 6.	
10 tons Tin, spot.....	20.70¢
10 tons Tin, July.....	20.65¢
10 tons Tin, July.....	20.50¢
(Seller's right to double.)	
FRIDAY, February 7.	
10 tons Tin, March.....	20.65¢
35 tons Tin, April.....	20.60¢
25 tons Tin, February.....	20.65¢
50 tons Tin, March.....	20.55¢
25 tons Tin, February.....	20.70¢
25 tons Tin, April.....	20.70¢
25 tons Tin, April.....	20.57½¢
25 tons Tin, May.....	20.57½¢
25,000 lb Lake Copper, April.....	14.15¢
MONDAY, February 10.	
20 tons Tin, spot.....	20.50¢
25 tons Tin, February.....	20.50¢
25 tons Tin, March.....	20.45¢
25 tons Tin, April.....	20.40¢
25 tons Tin, May.....	20.50¢
35 tons Tin, May.....	20.35¢
50 tons Tin, April.....	20.50¢
20 tons Tin, May.....	20.40¢
16 tons Lead, March.....	3.85¢
TUESDAY, February 11.	
75 tons Tin, March.....	20.40¢
10 tons Tin, May.....	20.40¢

Coal Market.

Depression in the Anthracite Coal trade is without relief and there are few events to vary the tiresome monotony. Reports come from Philadelphia that the sales agents at a meeting last week decided to restrict the February tonnage to 2,000,000 tons, against 2,500,000 tons in January. The demand for furnace and steam sizes is not appreciably diminished and some operators are unable to fill their orders. Pea Coal was advanced to \$1.40 @ \$1.50 at the mines. The Reading Company report an increase in Coal tonnage for week ending February 8, 1890, as compared with corresponding period in 1889, of 16,389 tons, and for year to date an increase of 86,194 tons, which does not look much like restriction. The official statement of tonnage for the week ending February 1 is as follows:

Region.	Feb. 1, 1890.	Feb. 2, 1889.	Decrease.
Wyoming...	237,092	289,910	52,818
Lehigh.....	107,457	74,200	*53,158
Schuylkill...	167,898	174,885	6,987
Totals tons.	512,447	539,094	26,647
Year to date	2,446,776	2,766,742	319,966

* Increase.

The anomalous condition of the market as respects prices may be inferred from the following observations of the Philadelphia Ledger: "Some of the iron furnaces in the Lehigh and Schuylkill valleys have

begun to use Broken Coal to make up the shortness in the supply of Lump and Steamboat sizes, and this will afford some relief to the market, which is gorged with a large accumulation of Broken, Egg, Stove and Chestnut sizes. The prices for the Domestic sizes of Anthracite are now weaker than they have been at any time since last May. Shading from the circular figures is being done openly, even by the larger mining and carrying companies. The Reading Company are selling to everybody at 10¢ per ton below the circular prices, and the agents of the Pennsylvania Railroad's coal companies are reported as selling their Anthracite at 20¢ @ 25¢ per ton below the circular prices. Coxe Bros. & Co. are said to be offering the product of their collieries at the following prices at the mines: Broken and Egg \$2.10 per ton, Stove \$2.25, and Chestnut \$2.15. The Wyoming and Lehigh individual operators have unsettled the New York and New England markets by openly selling Stove Coal at a cut of from 40¢ to 50¢ per ton, and in some instances at a greater concession, f.o.b. New York harbor."

It is stated in reference to the case of Coxe Brothers against the Lehigh Valley Railroad Company that no attempt to compromise has been made. Neither has the Interstate Commerce Commission given an intimation concerning its views or intentions.

Bituminous Coal is inactive and the market is comparatively weak. The standard quotation is \$3.25, f.o.b., in New York. Cumberland reports for the week ending February 1 72,754 tons Clearfield, 74,083; Beech Creek, 53,530; Pocahontas, 44,453. Huntingdon and Broad Top, week ending February 8, 34,204, an increase of 19,987, or 58%. No definite reports are made respecting contracts for the new year.

Imports.

Hardware, Machinery, &c.

Boker, Hermann & Co., Arms, cs., 47; Hdw., pgs., 31
Curley, J. & Bro., Cutlery, cse, 1
Field, Alfred & Co., Mdse., cs., 75
Folsom, H. & D. Arms Co., Arms, cs., 22
Graef Cutlery Co., Cutlery, cs., 7
Gatling Gun Co., Mdse., cs., 2
Graves, L. S., Mch'y, cs., 2
Lau, J. H. & Co., Arms, cse., 1
Morris, L. W. & Son, Mch'y, cse, 1
Morgan Engineering Co., Mdse., cs., 10
Newton & Shipman, Files, cks., 5
Schoverling, Daly & Gales, Arms, cs., 12
Sheldon, G. W. & Co., Mch'y, cs., 12
Stoddard, Lovering & Co., Mch'y, pgs, 25
Taylor & Taube, Mch'y, cs, 3
Taylor, Thos., Mdse., cs., 6
Watermann, H., Arms, cs., 16
Wiebusch & Hilger, Chains, cks., 2; Arms, cs., 25; Anvils, 172
Order—Stoves, 59; Cutlery, pgs., 2; Mch'y, cs., 10; Dutch Ovens, 425

Pittsburgh.

Office of The Iron Age, Hamilton Building, Pittsburgh, February 11, 1890.

Pig Iron.—As is well known, there were large blocks of Iron sold several months ago for future delivery. This Iron is now being delivered on former contracts and at prices a good deal lower than those now ruling. Large quantities are now being delivered at \$14.50 @ \$15.50 @ \$16 and Bessemer at \$18 @ \$19 @ \$20, and consumers will not want to make any additional contracts at present prices as long as they have this cheap Iron to take. However, in some respects the situation is more favorable to the producers. One of the most important of these is that most of the Iron held by the speculators has passed into the hands of consumers and will not come on to the market again, and then some consumers who have been drawing upon their stock and refusing to buy for some time past will be obliged to go on the market before long, as their supply is rapidly being reduced, and they

will soon be forced to replenish. There is no falling off in consumption, which is large; furnacemen have but little Iron to sell, and with the price of Coke advanced they will not feel like making any concession in price. Some of our best posted operators look for the market to stiffen up just as soon as consumers commence buying again, and now that the speculative lots have been disposed of and gotten off the market for good there is a very fair prospect for the realization of the expectations in question. Quotations may be fairly given as follows:

Neutral Gray Forge.....	\$17.50 @ \$18.00, cash.
All Ore Mill.....	19.00 @ 19.50, "
White and Mottled.....	17.00 @ 17.50, "
No. 1 Foundry.....	19.50 @ 20.00, "
No. 2 Foundry.....	18.50 @ 19.00, "
No. 2 Charcoal Foundry.....	22.00 @ 22.50, "
No. 1 Charcoal Foundry.....	24.00 @ 25.00, "
Cold Blast Charcoal.....	25.00 @ 26.00, "
Bessemer Iron.....	22.50 @ 23.00, "

Good brands of Forge Iron can be had at \$17.75 @ \$18, cash, and Bessemer at \$22.75 @ \$23, cash. One of our most active brokers reports having offered it freely last week at \$23, cash, without finding a buyer. There was a sale reported at \$22, cash, at valley furnaces, which would be equal to \$22.80, cash, Pittsburgh.

Muck Bar.—Continues very dull, but prices remain as last quoted, \$30 @ \$30.50, cash, at which range sales of 2000 tons were reported. Some of the largest buyers in this market have bought but little of late, but it is thought they will be on the market before long. While there is no difficulty in buying at prices quoted, some sellers are holding in expectation of being able to do better.

Ferromanganese.—Sales of 80 % reported at \$97 @ \$97.50, cash, at seaboard, for small lots for immediate delivery. Demand is chiefly for small lots, as consumers do not feel inclined to anticipate future wants at present prices, although in view of the scarcity of Manganese Ores there does not appear to be much prospect of a decline.

Manufactured Iron.—Demand good, but the feeling is not so strong as it was some time ago. There is no doubt in regard to a big spring trade, however, and just as soon as the market becomes more settled and buyers can be assured that there is no prospect of lower prices there will be a largely increased demand. Bars are still quoted at 1.90¢ @ 2¢; Plates, 2.40¢ @ 2.50¢; No. 24 Sheet, 3¢ @ 3.10¢; Grooved Skelp, 1.90¢ @ 1.95¢; Sheared do., 2.20¢ @ 2.25¢, all 60 days, 2 % off for cash.

Nails.—The demand for Cut Nails continues light, but it is expected to improve within the next few weeks. A good many of the largest buyers bought pretty freely prior to the recent advance and are now enabled to hold off for a time. However, so far as we can learn, the recent advance is being faithfully adhered to and manufacturers look for an improved trade within the next few weeks, as it will then be time for the spring trade to open up. We continue to quote at \$2.50, 60 days, 2 % off for cash. Carnegie, Phipps & Co. quote Wire Nails \$2.90, in car lots, 60 days, 2 % off for cash.

Wrought-Iron Pipe.—There is a good degree of activity for this season of the year, and the probability is that the Pipe mills will be fully employed before long. Some of them have all they can do at the present time. The indications are that natural gas and oil companies will want as much Pipe this year as last, hence the outlook for the Pipe trade is encouraging. No change in prices: Discounts on Black Butt-Welded, 47½%; on Galvanized do., 40%; on Black Lap-Welded Pipe, 60%; on Galvanized do., 47½%; Boiler Tubes,

1½-inch and smaller, 45 % off; 2 to 4 inch, 50 % off; 4-inch and larger, 52½ % off; Casing, 52½ % off.

Structural Iron.—A good demand is reported, with an increasing inquiry. No change in prices, with the exception of Bridge Plates, which have been reduced slightly. Angles, 2.45¢; Tees, 2.95¢; Channels, 3.10¢; Sheared Bridge Plates, 2.85¢; Universal Mill Plates, 2.55¢.

Wire Rods.—Are quoted at \$52 @ \$52.50.

Steel Plates.—Trade is reported fairly active and prices are unchanged: Fire-Box, 4½¢ @ 4½¢; Flange, 3½¢; Shell, 3½¢; Tank, 2.90¢.

Merchant Steel.—There is a continued good demand and prices are steady as quoted: Tool Steel, 8¢ and upward; Crucible Spring Steel, 4¢; Crucible Machinery, 5¢; Open-Hearth Steel, 2½¢ @ 3¢; Bessemer Machinery, 2½¢; Tire Steel, 2½¢.

Old Rails.—Old Iron Rails continue very dull; sale 1,000 tons reported at \$28. Brokers say it is very difficult to put them here from sources of supply at the price quoted, but for the time there appears to be very little call for them in this market. Old Steel Rails also less active and weaker; quoted at \$23.50 @ \$24.00.

Billets, Blooms, &c.—Bessemer Billets are weaker, and the demand is not as urgent as it was a few weeks ago. Sales reported at \$36 @ \$36.50, as to quality, size and delivery. It is intimated that some sales have been made a fraction under \$36. Nail Slabs are about the same as Billets, with rather more inquiry just now apparently for the former than the latter.

Steel Rails.—Heavy sections may be fairly quoted at \$35 to \$36, cash, at mill, with a single sale reported for March at \$35.50, while quotations are still made at \$36 @ \$37. So far as we can learn there have been no sales here above \$36, and then only for small lots. It is probable that a desirable order could be placed here at \$35.

Railway Track Supplies.—Demand continues light, but it is hoped that there will be an improved demand within the next few weeks. No change in prices. Spikes, \$2.15, 30 days, here, and \$2.25 delivered at Chicago, Milwaukee or St. Louis; Iron Splice Bars, 2.10¢ @ 2.20¢; Track Bolts, 3.10¢ with Square and 3.20¢ with Hexagon Nuts.

Old Material.—The demand is less active and prices are weaker. No. 1 Wrought Scrap, \$22.50 @ \$23 per ton; Old Car Axles, \$28 @ \$29; Cast Scrap, \$15.50 @ \$16, gross; Old Car Wheels, \$20.50 @ \$21; Steel Bloom and Rail Ends, \$25 @ \$25.50; Crucible Scrap Steel, \$29 @ \$30.

The appointment of John S. Slagle to the presidency of the Allegheny Bessemer Steel Company is regarded with great satisfaction by all concerned, directly as well as indirectly.

The casting of a cylinder at the Brooklyn Navy Yard for the engines of the new 3000-ton cruisers was, like the first one, successful. There have now been made two castings, and a third will probably be made during this week. Those already cast are in the hands of workmen who are making them ready for use. It is thought remarkable that the castings should be so successful, for they are the largest that have been cast in the yard for over 20 years—since the Alaskan engines were built.

Correspondents in Havana and the Bermuda Islands complain of the disastrous effects of warm weather upon the usual winter travel, few tourist visitors from the North having visited the tropics this season.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, February 12, 1890.

The Pig Iron market has been flat and prices have ruled very irregular. Business in Scotch Warrants was done at up to 52/10, but prices for those and other warrants have since fallen heavily, Scotch going to 51/4, owing to inability of Mellis, broker, to meet his engagements. The cause of the failure was through some of his clients not paying differences. Mellis' liabilities are estimated at about £10,000. The failure of a firm of Scotch shipbuilders has also unfavorably affected the markets. Makers' brands of Scotch are again generally lower, but on Middlesborough and Hematites makers refuse to follow the movement of warrants and hold for full previous prices. Exports from Great Britain to the United States during January were 9000 tons, against 10,000 tons during the corresponding period last year.

Copper had slow sale up to Monday, when about 500 tons Bars changed hands at £48. 10/. Since then there has been more pressure to sell, both near and distant deliveries, the result of which was a decline in prices to £46. 12/6 for spot. There are few speculative orders on the market at the present time. The French Government has issued an order against the directors of the defunct Société des Métaux and Comptoir d'Escompte, on the ground that they squandered the capital and divided fictitious dividends. It is expected that the affairs of the great Copper ring will be thrashed out.

Tin has been depressed and weak, immediately declining upon cessation of purchases for America, and going still lower under the influence of the "bear" party's efforts to depress prices. The fall was assisted by the weakness of the Iron market and decline in prices of warrants. The break in Tin during the week is about £3. To-day there was a larger trade doing at lower rates, with operations chiefly speculative, followed by a reaction.

For Tin Plates there has been little demand. American buyers refuse to pay the prices asked. Makers have held general meetings and several finally agreed to close their works two weeks during March, and to continue like stoppages at intervals, if necessary, to reduce the output. Makers appear determined and put on a bold front, hoping to change the bear tactics of merchants. Several large firms, however, refuse to join in the movement. Exports to United States last month 23,000 tons, against 28,000 tons in January, 1889. The new Cardonnel Plate Company has registered. The stock of Plates at shipping ports has further increased and amounts now to about 504,000 boxes, against 269,000 boxes on hand at the corresponding period last year.

At the annual meeting of shareholders of the Arizona Copper Company a report was submitted showing profits for the year to the amount of £61,000. The chairman referred to the prospects and

expressed opinion that steady business is in sight which will enable the company to begin payment of dividends.

Scotch Pig.—There is only a moderate business. Prices still irregular and lower on most brands.

No. 1 Coltness, f.o.b. Glasgow	75/
No. 1 Summerlee, " "	75/
No. 1 Gartsherrie, " "	75/
No. 1 Langloan, " "	75/
No. 1 Carnbroe, " "	56/
No. 1 Shotts, " at Leith	75/
No. 1 Glengarnock, " Ardrossan	75/
No. 1 Dalzellington, " "	64/
No. 1 Eglinton, " "	57/6

Steamer freights, Glasgow to New York, 2/; Liverpool to New York, 10/.

Cleveland Pig.—Business has been very quiet. Buyers stand aloof owing to weakness of warrants, while makers hold at 60/ for No. 3 Middlesborough.

Bessemer Pig.—The market has been dull. Buyers refuse to go on except at lower prices and makers still hold West Coast brands, mixed numbers, at 82/, f.o.b. shipping point.

Spiegel Eisen.—There has been a good trade at irregular and somewhat lower prices. English 20 % quoted 130/, f.o.b. at works.

Steel Rails.—Makers are firm at previous prices and the demand is fairly active. Heavy sections quoted at £7. 5/ and light sections £7. 12/6 @ £8, f.o.b. at N. W. England shipping point.

Steel Blooms.—The demand for these is good and makers are firm at previous prices. We quote £7 for 7 x 7, f.o.b. at N. W. England shipping point.

Steel Billets.—No change in makers' prices. Demand continues good. Bessemer, 2½ x 2½ inch, £7, f.o.b. at N. W. England shipping point.

Steel Slabs.—There is still a quite good demand and prices are firmly held. Bessemer, £7, f.o.b. at N. W. England shipping point.

Old Rails.—Very little doing in this line; buyers and sellers apart. Tees quoted at £4. 2/6, and Double-Heads, £4. 5/ @ £4. 10/, f.o.b.

Scrap Iron.—Business moderate, but holders firm at last week's prices. Heavy Wrought quoted £3. 10/ @ £3. 15/.

Crop Ends.—The demand moderate and prices without change. Bessemer quoted £3. 12/6 @ £3. 15/, f.o.b.

Tin Plate.—Transactions light and prices more or less nominal. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	17/6 @	...
IC Bessemer Steel, Coke finish	16/3 @	...
IC Siemens	16/6 @	...
IC Coke, B. V. grade	15/6 @	...
Charcoal Terne, Dean grade	14/6 @	15/

Manufactured Iron.—Dealings have been moderate and prices are about 5/ lower on Staffordshire Bars and Sheets. We quote, f.o.b. Liverpool:

Staff. Marked Bars	£ s. d.	£ s. d.
Common	9 15 0 @	0 0 0
Staff. Bl'k Sheet, singles	8 15 0 @	9 0 0
Welsh Bars (f.o.b. Wales)	10 15 0 @	11 0 0
	8 7 6 @	8 12 6

Tin.—Trading quite active to-day and the market looking firmer. Straits quoted at £91 @ £91. 5/, spot, and £92. 15/ for three months' futures.

Copper.—Operations continue moderate and prices are unsettled. Chili Bars quoted at £47, spot, and £46. 10/, three months' futures. Best Selected, £55.

Lead.—The market has been dull and prices are again a shade lower. Quoted at £12. 12/6 for Soft Spanish.

Spelter.—There has been a further decline and the market looks weaker. Quoted at £21. 10/ for Ordinary Silesian.

MARKETS BY TELEGRAPH.

WEDNESDAY AFTERNOON.

Pittsburgh.

The general Iron and Steel situation remains unchanged. While business in raw materials continues slow, there is a very good demand for the products, which it is expected will lead to an increased request for Pig Iron soon. The advance in Coke to \$2.15 $\frac{1}{2}$ ton, to take effect at once, will, it is expected, tend to stiffen Pig Iron and revive the market from the dullness which has recently characterized it. It is certain that the increased cost of Coke will make furnacemen less anxious to sell. Old Iron Rails said to be offered from Cincinnati at \$27.25, delivered in Pittsburgh. Muck Bar continues very dull. Bessemer Pig, it is thought, could be bought at \$22.50, cash, delivered in Pittsburgh; there appears to be no demand.

St. Louis.

The movement in Pig Iron is somewhat restricted, but all things considered the general tone of the market shows improvement. Connellsville Coke has been advanced 40¢ $\frac{1}{2}$ ton, to take effect immediately.

Cincinnati.

The reduction in freight rates noted in the last letter is looked forward to with hope and confidence by factors in Pig Iron. The opinion prevails that such a material decline can but reconcile the heretofore contending parties and largely increase the volume of business. Information from furnaces in the Birmingham, Ala., district, received this morning, heralds the fact that there is a unity of opinion there that it will avail nothing for Southern stacks to alter the position they have occupied for the past six weeks. The Pioneer Furnace is said not to be represented in this view. Prices of both Northern and Southern Iron are without quotable change, but Southern Gray Forge, in second hands, was offered at \$15.50, cash, Cincinnati, and refused this morning.

Chicago.

The Pig Iron situation seems to be growing better from day to day, more sales are being made and more inquiries are received. Buyers who have been holding out for lower prices are gradually making up their minds that it is entirely safe to place orders now. Contracts are known to be nearly run out in many cases which will have to be renewed, but rates are now so much higher that consumers hold off as long as possible. The Northern Ohio Irons have been advanced 50¢ $\frac{1}{2}$ ton on account of advance in Connellsville Coke. But Southern Ohio Irons are not affected, as their Coke comes from West Virginia.

Notice has been given that on the 15th inst. all Southern freight rates will be reduced 30¢ $\frac{1}{2}$ ton, which will make Southern Iron prices that much lower delivered in the Northwest. Bar Iron maintains old values and plenty of business is still in sight. Old Iron Rails are weak and quiet. Old Car Wheels are also quiet, but plenty of buyers are ready to take them at a slight decline. The local hardware trade had a meeting yesterday, and reaffirmed the old prices on staple goods. Steel Nails are still less firm than Wire Nails. No change in Barb Wire, but the recent advance is maintained.

Foreign Markets.

EQUIVALENTS.

	Cents.
Franc, Peseta or Lira.....	10.3
Florin (Netherlands).....	40.2
Florin (Austria).....	35.9
Wirels (Portugal).....	1.08
Wirels (Brazil).....	54.9
Mark (Germany).....	23.8
Kilogram.....	Pounds 2.205
Picul.....	134.

BRAZIL.

PARA, February 4, 1890.—*India Rubber.*—The market is cleared of Rubber and prices are advancing.—*Per cable direct.*

CHILI.

VALPARAISO, December 15, 1889.—*Copper.*—Europeans have commenced buying Chilean Copper mines. A Bremen banking firm bought the Challacollo Mine, paying for the same \$1,200,000. A Parisian banking concern purchased the Guanaco for \$3,600,000. The Inesperada was sold for \$45,000 and the Estrella de Venus and Chilena together for £180,000.—*Ferrocarril.*

EAST INDIES.

SINGAPORE, December 31, 1889.—*Tin.*—Has been dealt in to a moderate extent at from \$34.75 to \$34.90, but there are no sellers at the close at \$35.25. The advance is due to the sudden drop in exchange and not to any decided falling off in the supply, which, as is usual at this time of the year, is fully an average one. *Gum Copal.*—Nothing whatever has been done during the interval. *Gum Damar.*—There have been no arrivals. *Tonnage.*—Rates for London by steam are again weaker for January shipment, with 2/6 available for dead weight. For New York the Raphael is loading and the George S. Homer has not yet arrived. For Boston the Antioch has been laid on, but as usual on secret terms. *Exchange.*—Is steady at 3/2½ for six months' sight credit drafts on London. The Ulysses took for New York 1260 piculs Tin from here.—*Gilfillan, Wood & Co., through their agent in New York, Mr. Charles Nordhaus, 89 Water street.*

COLOMBO, CEYLON, December 19, 1889.—*Plumbago.*—Has been in good quest at well sustained figures. We quote at the close in rupees $\frac{1}{2}$ ton: Large Lumps, 210 @ 250; Ordinary Lumps, 180 @ 230; Chips, 100 @ 130, and Dust, 70 @ 100. Since October 1 shipments have been distributed as follows: To England, 39,530 cwt., against 15,434 same time previous year; to Hamburg, 2569, against 851; to Antwerp, 2778, against 1027; to Bremen, 308, and to the United States, 81,009, against 22,209; together 126,262, against 39,630 in 1888; 69,040 in 1887 and 67,607 in 1886. *Exchange.*—Six months' sight credit drafts 1/5¼ $\frac{1}{2}$ rupee.—*Volkart Bros., Ceylon and Malabar Coast, through their agent in New York, Mr. John W. Greene, 82 Wall street.*

SPAIN.

BILBAO, January 18, 1890.—*Iron Ore.*—The extraction of Ores from the Triano Mountain range is becoming more and more difficult as we proceed. Mine owners exhibit little disposition to sell much Ore unless it be at the notable advance they look forward to. Some few cargoes have been sold at 9/ @ 9/3 Rubios Superiores and 11/9 @ 12/3 Campanil. There are 160 vessels in port capable of loading 135,000 tons of Ore. *Pig Iron.*—Has declined slightly. Since the 1st inst. there were shipped 143,624 tons, against 262,147 in 1889.—*Bilbao Maritimo y Comercial.*

BELGIUM.

BRUSSELS, February 1, 1890.—*Iron.*—The Belgian Iron markets are for the moment disorganized, makers finding it difficult to get

any coal even at 23 francs $\frac{1}{2}$ ton and coke at 35. Merchant Iron advanced from 17.85 to 19.50 $\frac{1}{2}$ 100 kg.—*Moniteur des Interêts Matériels.*

The selection of a route for the ship water way from Pennsylvania to Lake Erie is discussed with much spirit by rival claimants in the Allegheny and Shenango valleys. The engineer of the scheme shows how all interests can be reconciled by including both valleys, which will be connected by a spur. He argues that it would be less costly to build the canal between New Castle and Sharpsville than from New Castle to the mouth of the Beaver. On the other hand, if the canal should come down the Shenango Valley, it will not be any more difficult to build a spur up the Mahoning as far as Youngstown. Along the Mahoning, up as far as the place named, there are many heavy-tonnage industries which would be immensely benefited by a ship canal. A Pittsburgh editor says: "We must have that canal. We can't do without it and neither can the great Northwest. The South, with its natural resources and the outlet of the Mississippi and its almost innumerable Gulf and Atlantic ports, will in time get up a world trade, in which, it is true, Pittsburgh may share, but at a disadvantage, but the great Northwest belongs to her, and if she does not secure a market for her manufactures and her fuel it will be her own fault, and 'now is the accepted time, now is the day of salvation!' What are \$10,000,000 to the continued supremacy of the Iron City? Less than 1 per cent. on its annual earnings."

The Portuguese Ministers of War, Marine and Finance have signed decrees authorizing the buying of eight war ships, four cruisers and four gunboats. Bonds will be issued to cover the indebtedness thus incurred. The government will send a floating drydock to St. Paul de Leando and another to Mozambique. Russia has ordered two large ironclad frigates to be built in England, to be provided with the biggest engines and the heaviest Krupp guns. The British Government has completed an arrangement with Captain Zalinski, and the Woolwich authorities have been ordered to construct fifty guns of his pattern.

The factory of the Ten Eyck Edge Tool Company, Cattaraugus, N. Y., was destroyed by fire on January 24, but the office and warehouse, which contained a small stock of goods, were saved. A new factory of greater capacity than the one burned is now in course of erection and will be put in operation as early as possible. It will be equipped with new and improved machinery, thus placing the company in better position than ever before to promptly execute orders.

The Cleveland Water-Works Board opened bids 7th inst. for 200 tons of main pipe, 36-inch, and 2300 tons of small pipe and 60 tons of main pipe of special make. The bids of the Cleveland Pipe Works, at New Philadelphia, and of the Lake Shore Foundry were the lowest and the contract, amounting to \$130,000, will go to one or the other concern.

The Massachusetts Superintendent of Prisons recommends the use of machinery in the penal institutions of that State, both in the interest of the prisoner who might learn to operate it and of the State. Thereby industries would be diversified and better results reached in every way.

The Washburn & Moen Mfg. Company, of Worcester, Mass., are going to add four large open-hearth furnaces to their plant, which now includes two furnaces.

Hardware.

The market remains in the same general condition as at our last report, with little if any increase in the volume of business. There is some complaint on the part of merchants and manufacturers that trade is thus far not up to expectations, and there is little doubt that the open winter has had something to do with this condition of things. In many parts of the country retail merchants refer to business as dull, but our advices are almost uniformly confident in tone, and it is expected that the season's business will be good. During the week which has passed since our last review of the market there have been very few changes in the price of goods. Export business is in a very satisfactory condition and recent orders cover a large amount and variety of goods. The competition existing between the shipping lines to Australia has resulted in reduced freight rates which have a good effect upon business.

Barb Wire.

The New York market continues without important change and the manufacturers are maintaining their former quotations. Some Western Wire is, however, being sold here at slightly lower prices, but this is not deemed of sufficient importance to justify change in ruling rates in this market. These continue as before: For Four-Point Galvanized, carload lots, 4 cents; 3-ton lots, 4.1 cents, and small lots, 4.3 cents, with deliveries.

A meeting of the manufacturers of Plain and Barbed Wire and Hardware jobbers of the Northwest was held at the Tremont House, Chicago, Wednesday afternoon, the 5th inst. The object of this meeting was mainly to take into consideration the prices at which Barbed Wire should be sold for the coming spring trade. The following companies and firms were represented:

The Illinois Steel Co., Chicago, by J. C. Stirling.
The Cleveland Rolling Mill Co., Cleveland, Ohio, by N. D. Pratt.
The Lambert & Bishop Wire Fence Co., Joliet, Ill., by Messrs Lambert and Bishop.
The Baker Wire Co., Des Moines, Iowa, by Geo. C. Baker.
The Ashley Wire Co., Joliet, Ill., by J. R. Ashley.
The I. L. Ellwood Mfg. Co., De Kalb, Ill., by E. C. Lott.
The Washburn & Moen Mfg. Co., by H. B. Cragin.
The Superior Barbed Wire Co., by Mr. Kellogg.
The Joliet Enterprise Co., Joliet, Ill., by F. H. Connell.
The Indiana Wire Fence Co., Crawfordsville, Ind., by O. M. Gregg.
Shreffler & Van Fleet, Joliet, Ill., by A. H. Shreffler.
The Janesville Barb Wire Co., Janesville, Wis., by Mr. Harris.
The Empire Mfg. Co., Rock Falls, Ill., by J. J. A. Zeller.
Hibbard, Spencer, Bartlett & Co., Chicago, by C. H. Conover.
Horton, Gilmore, McWilliams & Co., Chicago, by Jas. M. Horton.
Markley, Alling & Co., Chicago, by John Alling.
C. W. Hackett Hardware Co., St. Paul, Minn., by C. W. Hackett.
The Jno. Fritzlaff Hardware Co., Milwaukee, Wis., by Mr. Koch.
Farwell, Ozmun, Kirk & Co., St. Paul, Minn., by Mr. Farwell.
Wells & Nellegar Co., Chicago, by J. B. Nellegar.
The W. Bingham Co., Cleveland, Ohio, by Mr. Blossom.
A. F. Seeberger & Co., Chicago, by Mr. Penney.
Janney, Semple & Co., Minneapolis, Minn., by Mr. Hill.

C. W. Hackett was elected chairman of the meeting and E. C. Lott secretary. A large number of letters was read from those who were unable to be present, and hearty co-operation was promised in any

action that the meeting might take. The chairman invited a free expression of views from those present on the subject which had occasioned the gathering, and this invitation was very generally responded to. It was stated by those in position to know that there was no apparent possibility of the price of rods being any lower for the coming six months, as the bulk of the product was already disposed of. It was conceded that the jobbers could not hope to replace their stock of Barbed Wire, except at a material increase over the price paid for previous purchases. The general outlook for trade was considered to be very favorable. The almost impassable condition of the country roads had perhaps aggravated somewhat the ordinary dullness at this season of the year, but that was considered only temporary, and the opinion was freely expressed that it would be difficult to supply the demand for Barbed Wire which was certain to arise before the spring passed.

As a result of the conference, it was agreed, without a dissenting voice, to maintain the following prices on Painted Barbed Wire:

	Per 100 pounds.
In carload lots.....	\$3.35
In less quantities.....	3.45
With an advance all around for Galvanized of 60 cents.	

Subsequently a motion was carried with like unanimity to charge cartage on all shipments of less than carload lots.

We are advised that the utmost harmony prevailed in the conference, and the policy to be pursued by manufacturers and jobbers was decided upon with substantial unanimity. It is expected that as the result of the conference prices will be regularly maintained and the merchants thus be enabled to secure the profit to which they are entitled on Wire purchased before the recent advances.

Wire Nails.

A fair business is reported as doing in these goods and manufacturers generally speak hopefully of the situation and outlook. There is evidence of some desire to secure orders, and while the price remains substantially as before on a basis of \$2.90 for carload lots at factory, there are instances of concessions being offered.

A curious feature of the Western Nail trade is noted by a number of the leading jobbers. Within the past month or two the demand for Wire Nails has grown out of all proportion as compared with Cut Nails. It had been assumed from the progress of trade during the past year that Wire Nails had won for themselves a permanent footing which could be measured at nearly half of the Western demand for Nails. Orders received almost invariably called for an equal amount of Cut and Wire Nails. Now, however, a somewhat sudden change has occurred. Wire Nails seem to have grown in popularity in sections which had been slow to adopt them. The consequence is that jobbers are finding Wire Nails freely called for, while Cut Nails are only moving in about the quantity usually called for at this season. It is possible that the present movement in Wire Nails is merely a spurt without special significance, but it is being closely watched by the Hardware trade to see what it really means.

Miscellaneous Prices.

Another advance has been made in the prices of Hot Pressed Nuts, Square and Hexagon, of $\frac{3}{8}$ cent per pound. The market on these goods is regarded as very firm, and manufacturers are well supplied with orders.

Hemp and Flax Twine, owing to the advance in the cost of the raw material and the very low prices which have been ruling for some time past, has been ad-

vanced. The manufacturers of this line of goods, after conference on the situation, announced higher prices on the entire line, the advance being about 4 cents per pound.

There has been no further change in the prices of Files, but the moderate advances which have taken place are being maintained. The demand for this line of goods is referred to as fair, but not especially heavy.

Loaded Shells are held by jobbing houses at 40 and 5 to 40 and 10 per cent. discount, figures which are quite generally maintained. In exceptional instances, however, better prices are made.

Medford Fancy Goods Company, 44 and 46 Duane street, New York, quote their Dog Collars and Furnishings at discount 40 and 10 per cent. This company is, we believe, the only concern in the world making this line of goods exclusively.

Nason Mfg. Company, 71 Beekman street, New York, under date February 10, announce that the list prices for the No. 4 and No. 5 Nason Steam Traps of their manufacture will be advanced to \$42.50 and \$70 each.

Axes.

For some time past negotiations have been pending between the leading manufacturers of Axes, with a view to forming an organization which would render the manufacture and sale of the goods more remunerative than it has been of late, owing to the excessive competition and low prices. These negotiations have been attended with so much success that the American Axe and Tool Company have been formed by the consolidation of the interests of nearly all the leading Axe companies in the country. The officers of the company are: C. W. Hubbard, president; George T. Lane, first vice-president; H. G. Bixby, second vice-president; W. F. Norton, secretary, and Thomas H. Mann, treasurer. The offices of the company will be located in the Westinghouse Building, Pittsburgh. The parties to this consolidation are the following:

HUBBARD & CO., Pittsburgh, Pa.
DOUGLAS AXE MFG. COMPANY, East Douglas, Mass.
POWELL TOOL COMPANY, Cleveland, Ohio.
WM. MANN, JR. & CO., Lewistown, Pa.
ROBERT MANN & SONS, Millhall, Pa.
THOMAS R. MANN & CO., Millhall, Pa.
J. F. MANN & CO., Bellefonte, Pa.
ROMER BROS. MFG. COMPANY, Gowanda, N. Y.
JOHNSONVILLE AXE COMPANY, Johnsonville, N. Y.
UNDERHILL EDGE TOOL COMPANY, Nashua, N. H.
JAMESTOWN AXE COMPANY, Jamestown, N. Y.
H. KNICKERBACKER, Ballston Spa, N. Y.

In addition to the above it is understood that negotiations are pending with other manufacturers. It will thus be seen that the company embrace most of the prominent manufacturers, the exceptions being the Kelly Axe Mfg. Company, Louisville, Ky., and Collins & Co., Collinsville, Conn. The new corporation has purchased outright the plants of the different manufacturers who have thus consolidated their interests and will operate the plants, or as many of them as is deemed advisable, under the management in most cases of their former owners. The purchase includes also all the brands and trade marks, which will continue to be used substantially as heretofore. Those who are interested in this movement emphasize the point that this is not a trust but an absolute purchase on the part of the new company of the property of the manufacturers constituting it, and state that the object is not so much to advance prices as to secure economies in the manufacture and marketing of the goods. It is intimated, however, that some effort will be made to regulate prices in the ex-

port trade, which have heretofore been more or less demoralized, and if the plan is carried into operation it is to be expected that somewhat increased prices in the home markets will also prevail. The low and unprofitable prices which have for some time ruled would seem to require this.

Trade.

The open winter is reported in many sections as having a depressing effect upon trade, and the low prices which are ruling for farm produce in some States make the farmers feel poor. A leading Hardware house in Michigan thus refers to the situation:

Business in Michigan among the farming communities does not promise well. No snow in our State interferes greatly with certain lines, and this is our third open winter. We think some prices are going too high and must soon drop, but if our Congress increases duties and spends the surplus and makes silver as good as gold we will have a big time for a while, but when the drop comes it will be terrible.

Another Hardwareman thus refers to the business condition in that State:

A decrease in the volume of business in our line appears to be general, especially in Northern Michigan. Various conditions have brought this about. First, the farmers were obliged to market their crops at low prices, the returns not resulting in enough to discharge their current obligations, leaving them with no money to make new purchases, even for many necessary articles. Second, money is scarce as another outcome of this. Third, the open winter has prevented many small lumbermen from carrying out their work to advantage and profit. We cannot expect much change in volume of business until the new crop is marketed. While the advance in raw material warrants a reasonable advance in prices we regard it a difficult time to raise prices at all.

Charles H. Dodd, of the firm of Charles H. Dodd & Co., wholesale Hardware merchants, Portland, Oregon, spent a few days in Chicago last week on his way to the East. He reports a very satisfactory condition of business on the Pacific Coast. In Hardware, Machinery and Raw Materials the business of last year was much in advance of that of the previous year. The indications at present are in favor of a very handsome gain this year. Portland is constantly growing in population and business, while the country tributary to it is drawing a very superior class of settlers from the older sections. A remarkable example of the stability of the business interests of Portland is stated by Mr. Dodd. For more than 20 years there has not been a single failure in its commercial circles.

Organization among Farmers.

For several years the organization of farmers for their mutual advantage has frequently come to the attention of the trade, as efforts have been made to secure special prices and in other ways to advance their interests. Such attempts have been for the most part spasmodic and unsuccessful and have resulted in no permanent advantage to those participating in them. At the same time it is to be observed that the movement toward organization continues, and at the present time, taking the country as a whole, is unquestionably stronger than ever, a careful investigation showing that more than 1,000,000 farmers are thus associated together. The effort to control prices is not, however, a prominent object in all these associations and in many of the States has only an insignificant place. In other States, however, the farmers thus banded together have as one of their prominent objects the endeavor to regulate the prices of merchants, compelling them to sell at very narrow margins of profit. At the present

time such an attempt is being made more or less generally in Michigan and other Western States, and some of the towns in Michigan are experiencing not a little inconvenience on this account, where the organization goes under the name of "Patrons of Industry." Their plan is to find in the different villages or cities where the scheme is put into operation merchants who will bind themselves to sell to them at stipulated special prices, which are generally a small percentage above the actual cost of the goods. In carrying out this plan lecturers were sent into the field who readily convinced the rural population that they have been abused and imposed upon by the merchants and dealers, as well as by the railroads and manipulators of trusts, and when this point was reached a remedy was found in forming lodges to which men, women and children were admitted to membership on payment of a fee of \$1, more or less. After organizing a committee is appointed to wait upon the merchants and traders in the vicinity, to propose to them that they are to sell to the members of the organization all the goods they handle at an advance of 10 per cent. on cost, but that the same prices are not to be given to any other parties. It is also insisted that the merchant is to give to the members of the organization access to his books at any time, that they may be assured that the stipulations are carried out in good faith. These and other points, it will be observed, are covered in the agreement which is insisted upon, which is in the following form:

This agreement, made and entered into by and between —, of —, dealer in —, of the first part, and the Patrons of Industry, of the second part, witnesseth, that the said party of the first part, for and in consideration of the covenants to be performed by the parties of the second part, hereby agree with the parties of the second part as follows:

1. To sell goods to members of said Order as follows, to wit: — will sell all lines of goods in — store or that — may hereafter offer for sale at — store, at the following named prices (and furnish invoice of same if required) for cash or its equivalent in produce to be taken at the market price.

2. In case that any goods are sold to persons not members of the order, as a "leader" or "specialty," or for other cause, at less than the above rate, then the same kind of goods shall be sold to all members of the order at such special price.

3. The party of the first part agrees to show the invoice of said goods to any member of said order, having authority of said order, to be copied by said member if he so desires. And the said party of the first part further agrees that — will not sell goods to persons not members of the order at the prices aforesaid.

And the Patrons of Industry, parties of the second part, agree to and with the said party of the first part, to patronize said party of the first part in — line of goods, and to protect — by their efforts and influence. And the parties of the second part further agree that they will not make known to persons not members of this order the prices they pay for goods.

Should any member of the order feel himself wronged by any deal, he shall furnish the president of his association with the bill and a description of the goods purchased, giving kinds, marks, &c., sufficient to identify them, and said president shall investigate the same and if he cannot satisfactorily arrange the matter, he shall refer the same to the proper committee, who shall take action thereon.

And it is further agreed by and between the parties that this contract shall be and remain in force for — from this date, to be renewed if desired by the parties.

Witness our hands and seals the — day of —, A. D. 18—.

— [L. S.]
— [L. S.]

It is not at all probable that this movement will result in accomplishing the desired ends. Reputable merchants will not be ready to accede to the demands of the Patrons, and it is not at all likely that the movement will be carried on wisely or even honestly by its promoters. It seems, however, at present to be causing in Michigan a good deal of disturbance in business circles, and it obviously tends to increase the spirit of discontent and restlessness among the farming population, who at present low prices of produce do not find their occupation especially remunerative. A number of representative Hardware houses in Michigan have written us on the subject, giving careful data in regard to the movement and advising us how it is regarded by the trade, and its probable effect upon business. As these letters, besides giving information bearing upon this point, are also of interest as touching upon other matters relating to business, we make liberal extracts from them. A well-known Hardware house writing from Northern Michigan thus refer in some detail to the history and operations of the order:

This organization has formed various lodges in our vicinity during the past six months and one or more delegates have been appointed to confer with different merchants in regard to their signing an agreement binding for one year to sell all its members for cash at 10 per cent. above cost. As a rule the merchants in our city and surrounding towns have treated the delegates, as also the other members met in business course, with kindness, but firmly refused to enter into any contract to sell one class of customers less than another class, explaining at the same time that a merchant could not pursue such a course on business principles and be honest in the deal and afford to do it. Thus far no merchants of prominence have signed. In our city they have been unsuccessful in contracting with every branch of trade, and thus for many articles they resort to dealers in small towns, who, no doubt, for the present, are securing quite a boom in trade that is diverted from where it belongs, and for a time this will affect trade to some extent. The Patrons of Industry are largely made up of a disgruntled class of farmers who are not only in debt for their farms, but the majority of them in debt to the merchant who has granted them credit. One of the objects is to lessen the number of dealers, all uniting their trade with a dealer in each line of goods, aiming to boycott the other dealers and force them to abandon trade. A few days ago the different lodges of our county met in a convention, and apart from the class above mentioned we observed perhaps four or five of the better class of farmers who have joined the organization for political support. Much might be said concerning this order, which had its inception, we believe, at or near Port Huron, this State, and is a fat plum for the organizers, who are now invading a large portion of our State. Many have joined it, being assured that it will bring them large returns, especially farmers who have not developed their farms but depended upon doing lumbering in the winter. This resource gone, and small returns

from crops, they are ripe to join the order, which aims to pull down the prosperity of the merchant who has been friendly with them. In the first place, it will hardly be possible for this class to pay cash, and one good result for the merchant will be a weeding out of this class of credit customers. In our opinion the force of this order, if any, has already spent itself, and no doubt it will merge into an organization better for all concerned. The dealers who have signed the contracts on a 10 per cent. basis will not renew them in most cases.

From another point in the Western portion of the State we have the following advices:

The organization Patrons of Industry figures rather prominently among the farmers in surrounding territory, but have succeeded in securing but one store (a dry goods store) in our city, and as they have a variety of stores in surrounding towns our local merchants are experiencing some annoyance from the fact that members of this organization procure their supplies from surrounding towns. We, however, don't consider their organization a permanent one, as they require their stores to furnish their members with goods on a margin of 10 per cent., and an honest country merchant cannot afford to do business on so small a margin. Therefore the only merchants they can continue with them will be compelled to resort to dishonest practices, which will result in a general breaking up or a new schedule of profits.

A merchant in the Southeast refers to the movement in these terms:

The aim of the order seems to be a war on trusts and boards of trade and their immediate benefit to organize stores in the vicinity of those lodges who shall sell them goods at 10 per cent. profit over cost at wholesale, and when staples are below that price the dealer shall not charge more. There is but one dealer here who has entered into agreement with them. He sells boots and shoes, clothing and groceries and seeds. They claim to have 500 Patrons about here, comprising several lodges extending in different directions from the town. We find a great many good farmers will not enter the compact and totally ignore the scheme. They feel that this is only another Bohemian oat note dealer—in other words, a new way to swindle the farmer. They have solicited the dealers generally to open up their business to them, but so far have been refused. The organization has much to do to set the community, and especially farmers, in a restless condition and suspicious of business men. The business men feel that the order can last but a short time and business will return to its natural channel after a trial.

From another well-known house in the same part of the State we have received the following:

The plan of the Patrons of Industry seems to be to get one merchant in each line of business with whom they make a contract to sell them goods at a certain per cent. profit, and the trade of all Patrons to be thrown to him. Any goods that are usually sold without profit, such as Nails, sugar, &c., they expect will continue to be sold in that way. It is impossible to estimate the effect this combination will have upon trade, as its organization has just commenced in this section.

The following letter from another Hardware house refers in forcible terms to the movement and the way in which it is being carried on and gives some details in regard to its operation and effect:

The Patrons of Industry is a Michigan organization got up by irresponsible schemers and composed of farmers principally, although it embraces mechanics and laborers. It means another form of idiocy, and the noble tiller of the soil who grabs every swindle that comes along seems to be eager to fall in line with this scheme. They claim between two and three thousand members in this county. The qualification of membership is the ability to pay \$1. Briefly its object is supposed to be to compel the merchant to sell to P. of I's at 10 per cent. margin all goods they want, but to no one at that price who is not a P. of I. Penalty, if the merchants of that town will not sign, boycott the town. If in a certain line or lines no merchant will contract with them as above, they boycott that line. This city's hardware and dry goods stores are supposed to be boycotted for 60 days at this time, because none of us would sign. To illustrate its effect in a small town: Remus is a village in this county on the D. L. & N. R. R. It depends largely on farmers' trade. We have been jobbing Hardware, Stoves, &c., to a dealer there. He and the only other good square dealer in the town are moving out of the place. We are taking in his stock of Hardware to-day. We think the town is seriously hurt, as no good man will venture his time and capital there again. No first-class jobber or manufacturer sells goods to a P. of I. dealer, and many dealers who have signed contracts have quit.

Another representative house refers to the existing dullness in trade and the farmers' movement in the following terms:

All trade is in very bad shape. The general depression has something to do with it. This is also "tax time," and that is an element. But one of the principal reasons is the "Pink Eyes," a name given to the Patrons of Industry—so called—an organization of farmers which has strong membership in some sections of this State—in fact, is strong all over the State. One of their leading theories is that merchants are making too large profits, and to this they attribute their lack of prosperity. So to even up things, as they think, they ask that a merchant in each line of business make a contract with them to sell at an advance of 10 per cent. above the invoice. If they can't make such arrangements they boycott the town. Of course no honorable merchant will make such contract. Thus many towns are boycotted, and cross-road dealers that have but little credit, less reputation and no honor make the contracts and get the trade of the "Pink Eyes." This looks like a humbug and as though it could not affect trade, but it does, as almost any dealer in Michigan will tell you. Of course we expect it will run out after a little, as all such things usually do, but it is a very troublesome matter at present, and, with the open winter and "la grippe," "knocks us all silly."

Items.

Ironclad Mfg. Company, 22 Cliff street, New York, are taking steps to double their present facilities for the manufacture of their line of Ironclad Enameled Hollowware. The manner in which the trade have responded to the offering of the goods indicates the favor with which they are received, and the result has been that the manufacturing facilities of the company have been severely taxed. They expect to be in position to meet the anticipated large demand for the fall trade and are moving energetically in order to accomplish this as speedily as possible.

Charles B. Kelley, secretary and treasurer of Kelley, Maus & Co., Heavy Hardware jobbers, Chicago, retired from that firm on the 1st inst. to engage in the lumber trade at Kansas City. His stock in

the firm was purchased by Fred. Maus and David Kelley. The offices thus vacated have been filled by the election of Addison D. Kelley secretary and W. D. Wood treasurer. Both of these gentlemen will therefore be more prominent in managing the business interests of the house than has hitherto been the case.

Chas. E. Bristol & Bro., 404 North Gay street, Baltimore, Md., will in the early spring remove to a new warehouse now in course of construction, No. 224 North Howard street. Their new store will be four stories and basement, each 22 x 75 feet, and will contain all the latest improvements for the transaction of business. In connection with their line of Builders' Hardware and Tools they will handle Refrigerators, House-Furnishing Goods and all new novelties, and they state that they will be glad to receive from manufacturers and agents catalogues and quotations on such goods.

Hibbard, Spencer, Bartlett & Co., of Chicago, have issued a special catalogue of dairy supplies, covering railroad stock, Cream Pails, Setter Bottoms, Factory Can stock, Dairy Pails, Cream Gauges, made-up Milk Cans, &c. The various parts of Milk Cans are kept in stock and sold separately as desired. Special attention is called in the catalogue to the Delaware County Creamery, intended to hasten the cooling of milk so that all the cream can be raised between milkings. Several sizes are made to meet the requirements of dairy farms with from 2 to 35 cows.

Kelly Axe Mfg. Company, Louisville, Ky., recently sent one of their new pattern Axes to Mr. Gladstone and received under date January 8 a courteous letter in acknowledgment of it, in which reference is made to the excellent qualities of the Axe.

The Chapman Mfg. Company, Meriden, Conn., now have their business divided into three departments: Department A includes all their fine Harness Mountings and an extensive line of Saddlery Hardware; department B takes in Sleigh Bells, Call and Tea Bells, with a large variety of Horse-Hair Plumes; department C includes Dog Collars and Dog Furnishing Goods. In this department they are offering more than 500 different styles of Dog Collars, which are fully represented in their new catalogue, which is now ready for the trade. Among these are many new and attractive styles, two of which are illustrated in their advertisement on page 69.

Brittan, Graham & Mathes, Pittsburgh, Pa., have issued their price-list No. 1, which bears date January, 1890. It contains a condensed list of their Door Locks, Latches and Knobs, Builders' Hardware, Padlocks, &c., and will be found convenient. A convenient system is adopted in the numbering of the goods, so that the number indicates the special feature of the Lock. This system is thus explained:

Lock numbers terminating with—

- 1, represents Iron Bolts, Iron Key.
- 2, " Iron Bolts, Brass Key.
- 3, " Brass Bolts, Brass Key.
- 6, " Iron Bolts, Nickel-Plated Steel Key.
- 7, represents Brass Bolts, Nickel-Plated Steel Key.
- 8, represents Iron Bolts, Brass Key.
- 9, " Brass Bolts, Brass Key.

When more than one Tumbler is wanted add the following fractions to Lock number:

- $\frac{1}{4}$ represents 2 Tumblers.
- $\frac{1}{2}$ " 3 "
- $\frac{3}{4}$ " 5 "

When ordering Locks complete with Knobs and Escutcheons, add the following letters to number of Lock:

- V. Mineral Knobs, Japanned Roses and Escutcheons.
- U. Porcelain Knobs, Japanned Roses and Escutcheons.
- P. Porcelain Knobs, Silver-Plated Roses and Escutcheons.
- H. Porcelain Knobs, Porcelain Roses and Escutcheons.

When ordering Bronze Metal Goods, add the following letters to Bronze number to designate the design wanted:

A. Lotus; B. Bouquet; P. Plain.

Figure 6 at beginning of number represents Egyptian Bronze.

Figure 8 at beginning of number represents Bronze Metal.

Figure 9 at beginning of number represents Bronze Plated.

Figures 71 at beginning of number represent Jet Knobs.

Figures 72 at beginning of number represent Porcelain.

Brittan, Graham & Mathes have a number of new goods in the Builders' Hardware line, to some of which we shall have occasion to refer again.

A. Tredway & Sons Hardware Company, Dubuque, Iowa, have issued a very neat 36-page price list of Wood Stock, Iron and Blacksmiths' Supplies. In connection with the many useful lists contained in it they call attention to the fact that they intend to carry a full line of Iron, Horse Shoes, Nails and also Wagon Hardware, Malleable Iron, &c., with an especially complete line of Wagon Wood.

Shepard Hardware Company, Buffalo, N. Y., issue a receipt book for their Lightning Ice-Cream Freezers, a copy of which is packed with each Freezer. Aside from the recipes a description is given of the Freezers with illustrations of all their parts. A number of sample testimonial letters are also printed, many of them being from well-known houses.

Among the special notices on page 51 our readers will observe one, signed "A Location," in which an Eastern manufacturer announces his desire of removing to a manufacturing center so as to permit the enlargement of his business. This will doubtless receive attention from some of the many enterprising places which are offering inducements for the establishment of manufactures, and the fact that the concern in question is an old established firm with a good business will give the more weight to their intimation.

W. P. Kellogg, Troy, N. Y., issues a supplement to his catalogue in the form of a sheet relating to Curry and Horse Cards, illustrations of which are given, and also African Toilet Brushes. Another circular illustrates his new Push-and-Pull Window Blind Hinges, of which an illustration is given with mention of the advantages possessed by them.

A. H. Patch, Clarksville, Tenn., issues circulars illustrating and describing the Black Hawk Corn Sheller and Separator of which he is patentee and manufacturer. Its advantages are alluded to and a number of testimonials given in regard to its merits.

The D. W. Bosley Company, 273 East Madison street, Chicago, Ill., issue a circular describing their Peerless Rubber Window Cleaners, Floor Scrubbers and Bar and Counter Cleaners. Some of the special features of these goods are referred to and a price-list given.

Hibbard, Spencer, Bartlett & Co., of Chicago, have furnished their traveling salesmen with a most artistic collection of pictures advertising the Crown Flue Stopper. The pictures are all colored, and are of circular form on a square card. The cards are held together by an eyelet in one corner.

W. Dodman has removed his office to 103 Chambers street, New York, where he will continue to represent the important line of manufactures for which he is agent.

The first annual meeting of the Chapin-Wells Hardware Company, Duluth, Minn., was held 5th inst. C. W. Wells, C. H. Davis and F. C. Stone, members of the company from Saginaw, were present, besides C. C. Prindle, A. B. Chapin and

H. C. Crawford, of Duluth. The business of public importance discussed related to the new building which the company will build, and which will be ready for occupancy some time next fall. The plans call for a building seven stories high on Superior street and eight on Michigan. The building will have double basements, and the superstructure will be built to receive the heaviest possible loads. The floor above Superior street will contain the retail departments, and in the rear will be the offices. The wholesale and sample departments will occupy the other six stories. The building will cost a large amount of money. The first story will be built of brown stone, the remaining elevation of brick, with brown stone trimmings. The company will not award the plans under several weeks yet. Work will begin on the structure as soon as the season permits.

The trade will be interested in the announcement on page 55 in which the Cary Mfg. Co., 41 and 43 Center street, New York, refer to Cary's Universal Metal Strap, a substitute for strap iron, wood straps, wire and other material used for binding and packing cases.

Simmons Hardware Company, St. Louis, Mo., in their *Keen Klipper Herald* call attention effectively to the line of Lawn Mowers—the Keen Klipper and the Trojan—which they are offering. A variety of interesting matter relating to lawns and Mowers is given.

L. A. Sayre, Newark, N. J., in his catalogue and price-list No. 2 calls attention to an extensive line of Hardware specialties and Mechanics' Tools. Among these Apple Parers and Ice Creepers have a prominent place, but a number of important additions have recently been made to his line of small Tools, among which Spring Punches, Saw Tools, Box Scrapers, &c., may be mentioned.

C. T. Williamson Wire Novelty Company, Newark, N. J., describe in their catalogue an exceptionally extensive line of Wire Corkscrews, of which they are known as very large manufacturers. Their Ready Ceiling Hooks, and Steady Ceiling Hooks, Handy Hat and Coat Hooks, Picture Nails and miscellaneous Wire Goods are also represented.

Buck Bros., Millbury, Mass., have issued a new catalogue which is being sent out to their customers with the first shipment of goods. It is seven years since their former price-list was issued, and the increased size of the new volume indicates the progress they have been making during this time. It contains doubtless the best assortment of light Edge Tools, such as Chisels, Gouges, Turning Tools, Carving Tools, Plane Irons, Countersinks, Reamers and Nail Sets, which is to be found in the country. The different goods are satisfactorily illustrated with representations of the different sweeps of the Gouges and Carving Tools. The volume is prefaced by an excellent illustration showing the factory and a steel engraving of Richard F. Buck, which will be valued by those who know him personally and by the very many throughout the trade who are familiar with the line of goods made by this house. In the introductory address to their friends in the Hardware trade, after gracefully acknowledging the increasing patronage given to them, they say with reference to their goods:

There is no secret to our success in producing a good article. We make it our rule to buy the best material to be found in the market, we employ the most skilled workmen and give a constant personal supervision to the business, which we thoroughly understand. During the past 10 or 12 years our terms and prices have not materially changed. There has been little occasion for it. The high grade of English cast steel has not declined, and the

cost of skilled labor is no less. Some persons may express surprise that our Tools are somewhat higher in price than other manufacturers. They will cease to wonder when they learn how greatly best cast steel varies in cost—viz., from 7 to 15 cents per pound; and that of labor, though there may not be as much difference, there is still enough to make our goods higher than those of others who employ a cheaper class of workmen. We keep on hand in our warehouse the best assortment of Chisels, Gouges, &c., to be found anywhere, and we make it our pleasure to oblige our many friends by filling their orders with promptness. Our large variety of special Tools and odd sizes not ordinarily kept by the trade, and in some cases not to be procured elsewhere, induces some people to order these of us while buying their regular Tools of other makers. To these customers we would say there is, or ought to be, as large a per cent. of profit in selling a good article as a cheaper one. One of our very largest customers stated their house made more money selling Buck Brothers' Tools and ——— Saws than on anything they kept in stock, and to-day this firm carries a larger stock and better assortment of goods than any other house in the trade.

A new wholesale Hardware house has been organized in this city under the name of Sickels, Sweet & Lyon, who have leased the premises 35 Barclay street and 40 Park place, where they will soon have a fresh and complete stock of goods. The members of the copartnership are Robert Sickels, formerly of Sickels, Preston & Co., Davenport, Iowa, and Edwin S. Sweet and Henry M. Lyon, late of Gilbert, Sweet & Lyon. These gentlemen engage in this enterprise under what are regarded as especially favorable auspices, and there is certainly room in this city for another Hardware jobbing house who will carry on the business with enterprise and skill. Their many friends will wish them the largest success.

J. B. Schuyler & Co., Bloomsburg, Pa., for whom Tompkins & Adams, 116 Chambers street, New York, are agents, have changed the name of their Trap, calling it now Schuyler's Rat Killer, instead of the Ferret Animal Trap, which was understood by some in the trade to signify that it was for catching ferrets. Their circular relating to it illustrates its construction and points out the advantages possessed by it.

Chapman & Meehan, 140 Franklin street, New York, announce that the New York Wood Fiber Company, for whom they are agents, will shortly place on the market, at moderate prices, the Improved Wood Pulp Pail and the Seamless Paper Pail, a line of ware which is referred to as having marked improvements. Robert Coleman, recently associated with the American Indurated Fiber Company, has been engaged by them in connection with this department.

Obituary.

Many will learn with regret of the death of J. C. Schwartz, Natchez, Miss. He had been in failing health for some time past, and a short time since, that he might be relieved of the care and worry connected with his extensive Hardware business, transferred it to his son, J. E. Schwartz, and his son-in-law, W. P. Stewart, and retired to a more quiet life to enjoy the competency he had acquired after many years of industrious and successful labor. He was born at Rhein Pfalz, Bavaria, January 21, 1825, and had consequently just entered his sixty-sixth year at the time of his demise. He came to America when 15 years of age and resided in Natchez continuously for the past 45 years. He was prominently connected with the development of its business and was one of the incorporators of the N. J. and C. R. R., its first railroad outlet, and at the time of his death was president of the Rosalie Cotton Mill Company. From the way in which he is referred to by the press of the city it is evident that he was one of its most prominent and successful business men and held in high esteem.

Selling Goods Not Carried in Stock.

The importance of this matter has been recognized by many Hardwaremen, as evidenced in the letters which have appeared in our columns, but it is plain that there are others who do not recognize the amount of profitable business that can thus be done and the opportunity which is given to a live Hardwareman to sell many goods in lines related to those regularly carried in stock. The amount of business which can thus be transacted is indicated in a letter we have received from a merchant in an enterprising Ohio city, who advises us that they have for several years sold more goods not carried in stock than out of their extensive stock, the value of which is \$15,000 to \$18,000. The principles which have governed them and something of the methods followed are indicated in the letter, which we print in full:

Our experience in selling goods not kept in stock has probably been an exceptional one, owing to the fact that we are largely a manufacturing community, making it entirely impossible for any Hardware house to carry a line of goods covering their wants. It is my theory, and we work on it all the time, that no good salesman need ever miss a sale or lose a customer for want of goods in stock. My desk is pigeon-holed its entire length for small catalogues and circulars. Underneath it, in library style, I have all the large catalogues from Simmons' Jumbo to Ladd's Discount Book, 30 or more in all. These are a part of our stock, so far as keeping posted, watching prices and selling goods count. In addition we have a price-book of our own which is as carefully watched as any other detail of a retail business. The result has been that while carrying an average stock of from \$15,000 to \$18,000 worth of goods for the past three years we have sold more goods "out of stock" than from our shelves, not for lack of business enterprise in carrying goods, but because we can and do sell all bulky and odd goods that are expensive to handle and carry and that tie up money. One of your readers believes in carrying in stock everything there is a chance of having a call for. If he will stop to think that money invested in such goods ought to be worth 2 per cent. a month to him in his business, and the interest and wear and tear on goods not staple, and the dispatch with which merchandise can be brought to his market, new and clear, of the latest patterns the market affords, I think he will move to reconsider.

In the following letter, which comes from a well-known and enterprising house in Michigan, our correspondents allude to the advantage which is thus to be gained by the Hardwareman, but at the same time give a word of caution in regard to trespassing upon the trade of their competitors, and emphasize the point that the sale of goods not carried should be in Hardware or its related lines, provided other goods lying outside the Hardware field can be obtained through other houses in the place. But it will be observed that our correspondents recognize the importance of serving the customer and if possible seeing that his wants are supplied:

We have perused with interest the views expressed in *The Iron Age* concerning selling goods not kept in stock. Our own

experience would not differ materially from others, but we have been careful to avoid ordering any goods outside of our regular business where we had a dealer in the same line of goods our customer described, as it only results in arousing a hostile feeling that would conflict with our own business. But where the dealer manifested a lack of enterprise to keep in stock, or even order, we would not allow a customer to go elsewhere, but in some cases have ordered for him to control his trade from some other point. We realize the growing tendency to depart from the strictly Hardware business in order to keep up a profit, and also the fact that many customers like to purchase at one place all they may need in furnishing and become attached to one particular dealer or store. In short, we aim to confine ourselves as closely as possible to our own trade, ever ready to order anything in our line not carried in stock, and on the alert not to allow a customer to leave our city without securing what he needs, even if it involves taking a personal interest in aiding him to secure it. In conclusion, we are strong in the opinion that it pays to keep the line of your own business up to the highest standard, which is best accomplished when you adhere close to it and strive to build other dealers up in their line as you would like them to aid you with new customers.

Arrangement of Stores.

The accompanying illustration represents an Axe rack, which, as indicated, is placed on the counter. The outer edge is about 4 inches high, the entire height being about 6 inches. The partitions which separate the different Axes run, as shown,

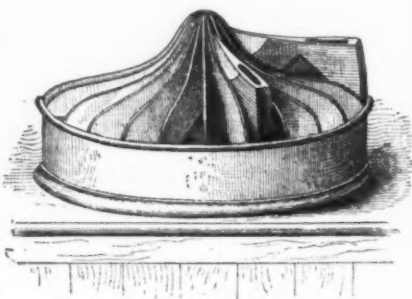


Fig. 423.—Axe Case.

to a common center. The Axes are placed on their edges with the bits pointing to the center. This rack can obviously be finished in different attractive styles, the one referred to by our correspondent being painted gray, striped with bright red. The bottom on which the Axes rest is solid. It is also suggested that the rack can be made with a pivot in the center and trunk rollers underneath it on the edge so as to permit its revolving readily.

A correspondent suggests that shelving held up by japanned shelf brackets, instead of wood partitions, makes an attractive appearance. It is also suggested that drawers under the show-windows serve a very convenient purpose, being adapted for holding a variety of goods.

It is also suggested that a 2½ foot platform along the wall is a desirable way of accommodating Shovels, Spades, Scoops, &c. These goods are to stand on the platform, the handles being separated by single 10-inch harness hooks. A foot above the top of the D. H. goods there may be another platform, 2 feet wide, separated by japanned brackets, with handles separated by harness hooks, the Forks on this platform to stand tines down.

From a well-known Western house we have received a description of their method of sampling some of their goods in which

there is a departure from the practice of other houses. Hammers, Hatchets, Braces, Saws, &c., they hang on brass head nails, as indicated in the accompanying illustrations, Figs. 424 and 425. Quite frequently Hatchets, Hammers, &c., are hung with the metal parts down and the han-

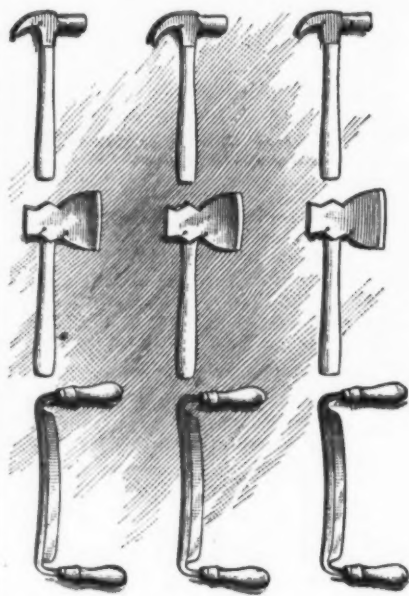


Fig. 424.—Method of Sampling Hatchets, &c.

dles up with screw eyes on end. Our correspondents use no screw eyes on any of their samples, nor are they fastened permanently with wires or screws, but are all hung loose on brass head nails driven in grained and varnished grooved boards on a portion of their side walls, thus making the goods handy to reach, easy to

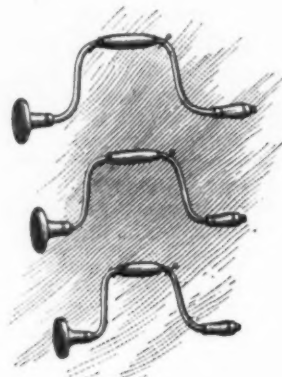


Fig. 425.—Samples of Braces.

take down and securing an arrangement which looks well. On most of their samples when practicable they mark the retail price in pencil.

Exports.

PER SCHOONER GEO. V. JORDAN, JANUARY 30, 1890, FOR PORT ELIZABETH, SOUTH AFRICA.
 By Goulds Mfg. Company.—21 Pumps.
 By Healy & Earl.—2 boxes Feed Cutters.
 By J. Norton & Son.—120 dozen Pick Handles.
 By R. W. Forbes & Son.—4 cases Plows, 15 dozen Axes, 1 package Axle Boxes, 1 package Plow Handles.
 By A. Field & Co.—44 dozen Axes, 2 dozen Hammers, 21 pounds Air Gun parts, 25,000 Cartridges.
 By Corner Bros. & Co.—106 cases Agricultural Implements, 110 kegs Nails, 40 dozen Picks, 50 dozen Pick Handles.
 By Oelrichs & Co.—2000 pounds Nails, 30 dozen Axes, 9½ dozen Hardware, 120 dozen Wood Handles.
 By W. H. Crossman & Bro.—125 dozen Carpenters' Tools, 1½ dozen Hand Carts, 12 dozen Curry Combs, 17 dozen Hardware, 2 cases Hardware, 30 dozen Carpenters' Tools, 20 gross Stove Polish, 124 packages Carriage-

ware, 1 case Hardware, 23 packages Carriage-ware, 26 packages Carriage-ware, 57 Cases Agricultural Implements, 15 dozen Handles, 7 cases Meat Choppers, 6 dozen Traps, 60 Ladders, 5 bundles Ladders, 220 dozen Handles, 175 cases Agricultural Implements, 7 crates Agricultural Implements, — packages Agricultural Implements, 8½ dozen Pumps, 32,500 pounds Nails.

By Coombs, Crosby & Eddy.—36 cases Plows, 6 Plows, 80 cases Sash Weights, 1 case Sash Cord, 3 Wagons, 2 Wagons, 12,500 pounds Nails, 56 Plows, 60 dozen Hatchets, 160 dozen Handles, 7 dozen Axes, 1 dozen Hay Cutters, 1 Scale, 6 Trucks, 150 dozen Handles, 1 dozen Barrows, 6 dozen Platers' Hoes, 2 dozen Bench Screws, 11 dozen Hardware, 3 dozen Meat Choppers, 3 dozen Agricultural Forks, 4600 pounds Nails, 56 Plows, 6 Corn Shellers, 1 dozen Washboards, 76 dozen Handles, 110 pounds Nails, 460 pounds Manila Rope, 29 cases Plows, 1600 pounds Jute Rope, 1 gross Satin Polish, 2 dozen Pumps, 15½ dozen Hardware, ½ dozen Meat Cutters, 13½ dozen Tools, 2 dozen Tobacco Cutters, 1 dozen Corn Mills, 36 dozen Wrenches.

PER BARK GALATEA, FEBRUARY 3, 1890, FOR MELBOURNE, AUSTRALIA.

By Meriden Britannia Company.—7 packages Plated Ware.

By H. Diston & Sons.—1020 pounds Hardware.

By L. D. Crossmond & Co.—1749 pounds Cultivators.

By Hsley, Doubleday & Co.—6¼ gross Axle Grease.

By Sargent & Co.—58 cases Hardware, 12 packages Castings, 17 dozen Bells.

By Metal Stamping Company.—1 case Bolts, 2 cases Sandpaper.

By Edward Miller & Co.—5 boxes Lamp Goods, 10 packages Lamp Goods, 1 box Lamp Goods, 87 packages Lamp Goods.

By Healy & Earl.—2 boxes Grain Mills, 5 boxes Blowers, 2 boxes Emery-Wheels, 3 Forges.

By H. W. Peabody & Co.—25 cases Hardware, 144 rolls Picture Cord, 12 dozen Glue, 72 Money Drawers, 64 cases Lampware.

By R. W. Forbes & Son.—10 packages Hardware, 7 packages Carriage Hardware, 1 case Axes, 5 packages Hardware.

By Morris, Strouse & Co.—109 dozen Tools, 14 dozen Gun Implements, 24 dozen Mouse Traps, 4 gross Iron Spoons, 54 dozen Wire Cord, 3 dozen Wringers, 24 dozen Tools, 6 gross Mouse Traps.

By Arkell & Douglas.—132 dozen Handles, 10 dozen Hammers, 22,400 pounds Barb Wire, 6 dozen Plated Ware, 7½ dozen Wringers, 10 dozen Hammers, 8½ dozen Lampware, 1 Scale, 4 Bolt Cutters, 12 reams Sandpaper, 1568 Couplings, 30 dozen Carriage-ware, 4000 pounds Bolts, 6 dozen Meat Choppers, 731 pounds Tinware, 1 dozen Wringers, 12 dozen Handles, 612 pounds Hardware, 3600 pounds Bolts, 84 dozen Handles, 6 dozen Wrenches, 3 dozen Rakes, 1 dozen Wringers, 3 Stoves, 8 dozen Axes, ½ gross Axle Grease, 264 dozen Handles, 12 dozen Bench Screws, 9500 pounds Nails, 10 rolls Sandpaper, 3 dozen Latches, 40 pounds Drills, 1230 pounds Hardware, 36 sets Axes, 119 pounds Rubber Springs, 6630 pounds Castings, 1841 pounds Bolts, 2 dozen Leather Dashers, 40 dozen Carriage-ware, 3 dozen Rakes, 800 pounds Tacks, 56 dozen Axes, 6 dozen Meat Choppers, 3 Lawn Mowers, 3 dozen Springs, 5760 pounds Bolts, 16 dozen Bench Screws, 8400 pounds Castings, 2 dozen Wringers, 10 dozen Wrenches, 45 dozen Axes, 3 gross Braces, 120 gross Rivets, 5000 Cartridges, 660 dozen Handles, 800 pounds Castings, 2 cases Plated Ware, 800 pounds Wheels, 1457 pounds Axes, 1 case Lamp Ware, 5 dozen Screws.

By Welsh & Lea.—2 dozen Lawn Mowers, 2 crates Lawn-Mower Handles, 4 cases Lamps, 8 cases Hardware, 5 cases Saws, 1 case Tinware, 7 cases Clamps, 3 cases Hardware, 1 case Saws, 10 packages Axes, 10 cases Hardware, 9 cases Saws, 4 cases Stone, 2 cases Handles, 1 case Forks, 1 case Axes, 10 cases Grindstone Fixtures, 1 case Rat Traps, 1 case Whetstones, 32 cases Axes, 3 cases Hauls, 2 cases Braces, 1 case Chisels, 1 case Hooks, 2480 pounds Axle Grease, 29 cases and 3 packages Hardware, 30 kegs Nails, 21 crates Ranges, 48 dozen Axes, 10 dozen Mattlocks, 2 cases Glue, 10 dozen Forks.

PER BARK POLYCARP, FEBRUARY 4, 1890, FOR WELLINGTON, NEW ZEALAND.

By W. & B. Douglas.—30 Pumps.

By Collins & Co.—6 dozen Picks.

By H. Diston & Sons.—1543 pounds Hardware.

By Welsh & Lea.—3 cases Hardware, 8 crates Churns.

By W. H. Crossman & Bro.—2 Drilling Machines, 70 dozen Axes, 6 dozen Hoes, 3 cases Hardware, 1 case Horse Collars, 1 case Hardware, 500 pounds Iron Nails, 6 dozen Grindstone Fixtures, 53 Churns.

By H. W. Peabody & Co.—5 Lawn Mowers, 25 cases Hardware, 3 dozen Grindstone Fixtures, 74 dozen Handles, 500 pounds Horse Nails, 4 Lawn Mowers.

By McLean Bros. & Rigg.—6 Mangles, 1 gross Axle Grease, 12 dozen Washboards, 2 dozen Pumps.

By R. W. Forbes & Son.—3¾ dozen Carpenters' Drills, 1 dozen Carpet Sweepers, 54 dozen Axe Handles, 12 dozen Washboards, 1 case Mouse Traps, 10 packages Hardware, 1 box Corn Shellers, 2 packages Pumps, 3 crates Corn Shellers, 9 packages Hardware, 6 dozen Forks, 3 dozen Shears, 4 dozen Fork Handles, 20 dozen Rake Handles, 3½ dozen Wringers, 1217 pounds Carriage Bolts, 1 case Tire Bolts, 11 racks Churns, 2 packages Hardware, 27 dozen Hoes, 3 packages Sad Irons, 6 dozen Egg Beaters, 6 packages Carriage-ware, 10 boxes Polish, 8 racks Churns, 9 dozen Wrenches, 30 dozen Axes, 30 cases Axe Handles, 10 dozen Spade Handles, 16 packages Hardware, 10 dozen Spade Handles, 30 dozen Tacks, 6 packages Oil Stone, 6 packages Churns, 14 packages Hardware, 110 pounds Sash Cord, 70 dozen Axe Handles, 5 packages Hardware, 15 dozen Axes, 5 packages Hardware, 5 packages Churns, 3 dozen Rakes, 2 boxes Oil Stone, 4 packages Hardware, 8 dozen Pulleys, 60 dozen Axes, 1331 pounds Horse Nails, 30 dozen Axes, 25 dozen Axes, 2829 pounds Horse Nails, 12 dozen Axes.

REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

Paints and Colors.

Trade has been hardly as good this week as last. Local orders have fallen off somewhat, and those from out of town have not been in line with the average for the past four or five weeks. Both manufacturers and jobbers state that their total sales are running ahead compared with the results a year ago, however, and there is a general good feeling not only as regards the amount of business passing, but with respect to the outlook. Values are showing remarkable steadiness on nearly all the staple articles, and the tendency appears to be more in the direction of improvement than otherwise. No specially new features have developed during the week, apart from an advance in the price of Linseed Oil that brings the cost of the latter up to a point which prompts manufacturers to take some steps in the direction of advancing their prices for ready-mixed Paints and other productions in which the Oil is extensively used.

White Lead, &c.—Lead in Oil has been moving very steadily. Large buyers have not figured with any prominence, they having previously made ample provision for their wants for some time ahead; but small orders make a good showing and corrodors and jobbers agree that the distribution is better now than it was a year ago. Trust prices are maintained by all manufacturers of reputable Lead and jobbers are not found to be doing cutting. Inferior Lead sells at all manner of prices, but in a limited way only. For Red Lead and Litharge there is about the usual demand and prices remain as before, with sellers firm.

Zincs.—The market for American Oxide is very firm, without, however, any change in manufacturers' prices or in jobbers' figures. Current purchases are chiefly on the hand to mouth order, but well up to the average volume. Foreign Zincs are firmly held at the advanced prices established last month and the sales making are of about the usual character and amount.

Colors, &c.—House painters' colors in general remain quite steady at about the former range of prices and are selling fairly well. Grinders' colors hold their

own also, but are rather quiet. The Paris Green situation is unchanged. Quicksilver Vermilion is noticeably firm and will likely be advanced should there be any further rise in the cost of Quicksilver.

Miscellaneous.—Block Chalk on the spot is firmly held at last week's prices. Whiting is yet a trifle irregular, with over 40¢ for Common and 50¢ for Gilders, secured for small quantities only. Paris White is quite steady and selling fairly. Barytes still in comparatively light supply and firm.

Animal and Vegetable Oils.

The chief feature in this line have been a rise of 1¢ per gallon in the price of Linseed Oil and continued fairly liberal transactions in Cotton Seed products at steady prices. Outside of the above the market has really been bare of interesting feature. Business in nearly all branches has moved along in about the routine way, at all events, and prices have shown none but unimportant changes, while the conditions affecting movement and values appear to be practically the same now as at the beginning of the month. No important changes are looked for in the immediate future and there are no indications at the moment of much variation in the volume or character of business.

Linseed Oil.—City crushers have advanced their prices to 61¢ for domestic and 63¢ for Calcutta seed Raw Oil. Prices for Boiled Oil are correspondingly higher. The advance is due to high cost of raw material and in probability of cheaper seed in the near future. Out-of-town brands are coming to this market in limited quantities only and the receipts are closely taken up at 59¢ @ 60¢, according to size of lot. The demand is fairly liberal for this season of the year.

Cotton Seed Oils.—Crude has remained very steady at 28¢ for prime quality and transactions make a good showing, with the aggregate fully up to that of the preceding week. Summer Yellow is still in very good demand, more particularly for export, and upward of 4000 barrels have been sold during the week. The bulk of the business was at 34¢, but exporters secured a few lots at about ¼¢ less. There is little or no change in the general situation.

Lard Oil.—No further change has taken place in the market for this article. Prime quality, city or out-of-town make, still brings 52 @ 52½¢, and the supply is not excessive, although sufficient to enable sellers to promptly fill orders for either jobbing quantities or round lots. The demand is fair.

Sperm Oil.—About 120 barrels of Crude Sperm have been sold in this market at 65¢ for export. This price is considerably below the figures generally asked, and it is doubtful that the purchase could be duplicated. The manufactured products are selling very fairly and remain steady at previous prices.

Whale Oils.—There is no movement yet of the Crude article, and prices are wholly nominal. The manufactured products are selling to a fair extent in small quantities at firm prices.

Menhaden Oils.—The prices ruling for several weeks past are still quoted on Crude product, but the demand at present is moderate. Pressed and Bleached Menhaden, Bank and Straits oils are steady, but rather slow.

Olive Oil.—High cost tends to restrict business more or less, but there is no accumulation of stock here worth speaking of, and holders keep their prices very firm, quoting 87 @ 89 for yellow in barrels.

Cocanut Oils.—Arrivals from Ceylon have been quite heavy, but the greater portion went to consumers on previous purchases, and the prices for spot lots are held firmly at about 5½¢ @ 5½¢. There is no change on Cochin or Domestic.

Family Hatchet and Ice Pick.

The Empire Portable Forge Co., Lansingburg, N. Y., for whom Surpless, Dunn & Alder, 97 Chambers street, New York, are agents, are putting on the market the G. Washington Family Hatchet and Ice



Family Hatchet and Ice Pick.

Pick represented herewith, the purpose of which is indicated in its name. It is made under a patent dated January 28, 1890. The head is described as made of warranted cast steel, finely nickel-plated. The blade is $4\frac{1}{2}$ inches wide and measures 7 inches from bit to point. The utility of the tool and the excellence of the workmanship are referred to by the manufacturers. The goods are packed in paper boxes of one-half dozen each, six dozen in a wooden case.

Improvement in Plow Points.

An illustration is presented herewith of an improvement in plow points which has been invented by J. Brinkerhoff, Auburn, N. Y., and on which a patent was granted December 10, 1889. This improvement will be used by various plowmakers in connection with their regular points, and it is stated that the goods thus made will be sold usually without increase in price, although in some cases a slight advance may be made. The Gale Mfg. Company, Albion, Mich., are the only manufacturers

tion is to steady the plow and keep it in its proper course. It is thus to correct the tendency of the point to dodge sideways out of line of draft and out of the ground, especially when the point becomes somewhat worn or when the ground has become dry and hard. This dodging of the point is referred to as occasioning a large part of the labor of holding and guiding the plow. The point never does and cannot, it is stated by the patentee, leave the ground by a straight upward movement because of the strong downward draft of the plow, and it must therefore take a sidewise movement and get out of the line of draft.



The Favorite Lawn Rake.

This sidewise movement is prevented by the improved form of the point shown in the illustration. This improvement consists of a guide attached to the under side of the plow point, and is composed of a flat piece of metal about 5 inches long by $\frac{1}{4}$ inch or 1 inch wide or deep, which is as thin as is consistent with the requisite strength. It will be perceived that with this flat blade of metal down its full depth or width in the compact ground at the bottom of the furrow the dodging of the point is overcome, as above stated. While this guide is a help in guiding the plow when the point is new and the ground soft, it is when the point becomes dull that its utility is most apparent, in that when the ground is dry and hard plowing may be done which without it would have to be

unload the rake it is only necessary to push backward without raising it. The lightness of this article and its durability and low price are points also alluded to by the manufacturers.

"Going on the Road."

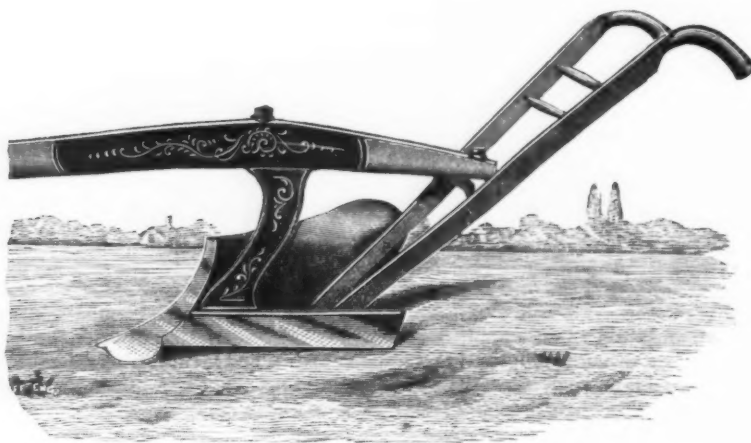
At this time of the year many young men are preparing to make their maiden commercial trip, and the ambitious young man, especially he who chooses a commercial life, sooner or later desires to go "on the road."

It would be well for our young friends to bear in mind on their first trip that to be a successful traveler requires special qualities; to sell a sufficient number of goods to make a trip pay means hard work with innumerable perplexities. Good salesmen invariably command high salaries, which means years of experience, not an occasional trip at convenient intervals, but with the important requisites, sticking to business and perseverance.

The first venture is always a memorable one. If a young man, on his return, after an absence of six weeks, was sent by his employer over the same territory, without giving him time to vent his feeling and relate successes and failures, he would immediately give up and think his lot almost unbearable.

The first impression for a time is pleasant, but somewhat troublesome to the novice, meeting as he does new faces, treated, to be sure, as a gentleman, but with a coldness always evident in new acquaintances. Again, though this young man has qualities which may insure his ultimate success, the fact that he is meeting those to whom in the future he is to sell goods and must, therefore, make a good impression, keeps his mental faculties working vigorously, expanding his powers, at the same time laying a foundation for his second trip. Traveling men may be classified, the high-salaried, men of experience—these, of course, are experts in their lines, receiving orders regulated largely by the demand.

The second class, known as the "boys," are the lively element. "Good fellows," never lacking friends, of course; at them



Improvement in Plow Points.

at present embodying the improvement in their goods, and they are sending their plows thus equipped to their various agents. Other concerns preparing to adopt the improvement are the Wiard Plow Company, Batavia, N. Y.; the Syracuse Chilled Plow Company, Syracuse, N. Y.; Eddy & Sons, Greenwich, N. Y.; the Bucher & Gibbs Plow Company, Canton, Ohio, and a company at Sheboygan Falls, Wis. As is obvious after an inspection of the engraving the purpose of the inven-

discontinued. The satisfactory use of the guide in stony ground is also emphasized. The fact that this improvement may be embodied in the plow without involving additional expense to the farmer, together with the other advantages manifest from this description, are referred to by the patentee.

A large freighthouse of corrugated iron is about to be erected in Jersey City by the Lehigh Valley Railroad Company.

much of the opprobrium is cast; naturally they need watching, and pushing them occasionally aids in holding trade, an aggressive competition keeping them wide-awake.

The so-called striplings belong to the next class, known as the young men. Many a sermon has been well-directed to these aspiring youths, who need about as much energy to avoid temptation as they do to dispose of goods. Because a few somewhat vilify their lives traveling, it has caused such expressions as "Beware of traveling men." Those are not, however, the successful salesmen, nor, as a rule, do they represent first-class houses.

Look out for the commercial traveler who does not adhere to all commandments essential to an upright life. The ambitious young man, then, who keeps in mind a few simple requirements to be known as a gentleman, will never "lose his grip," and in a short time will be among those who are to figure largely as the successful American merchants.—*American Merchant.*

The Sweet Refrigerators.

The Sweet Refrigerator Company, Canajoharie, N. Y., are putting on the market a line of Sweet's patent dry air refrigerators, meat market coolers, grocery boxes, beer coolers and ice chests, which are fully illustrated in a pamphlet which represents the different patterns. One of these is shown in the accompanying illustration, which indicates some of the new features possessed by these goods. It is to be observed, as indicated in the cut, that instead of being lined with zinc these refrigerators are lined with wood, the wall being filled with a compound which is described as perfectly harmless and a preserver of wood, a construction which is alluded to as possessing many advantages, among which are that the air in the refrigerator is always dry, that the con-



The Sweet Refrigerator.

sumption of ice is much less than in other refrigerators and that articles of food keep sweet and wholesome with unimpaired flavor a much longer time than is usual. The point is also made that these refrigerators have one-fourth more inside space than others with the same outside measurement. They are also so arranged as to be easily cleaned, all the inside work being conveniently removable for cleaning or repairing. These refrigerators are made in a variety of patterns, some of which are ornamental, and in combination with sideboard. The company lay special emphasis on the dryness of the air and give a number of testimonials showing the satisfactory manner in which food is preserved, indicating at the same time a remarkable economy in the consumption of ice. With reference to both of these points one of the testimonials published gives details in regard to the tests to which the refrigerator was subjected and the number of pounds of

ice used in it during the month while the trial was being made, and at the same time it states some surprising results as to the keeping of fruits, &c. In illustrating the dryness of the air the following statement is made: "On April 10 a saucer of salt covered with $\frac{1}{4}$ inch of water was placed inside. At the end of 10 days the water had entirely disappeared and in a short time the salt became dry and has so remained and is now fit for table use."

of twine an hour. As compared with the present twines used for binding, it costs much less to make, and from 5 to 7 cents an acre will be the cost of its use. The twine consists of hay twisted tightly and firmly, held together by cotton thread. It has also been woven into bagging for shipping cotton. For this purpose it has proved admirable, being strong and very durable. It is about one-third the cost of jute, and is much more serviceable. The



Walker's Improved Tobacco Cutter.

The catalogue of the company gives other information in regard to these goods and the special features of their construction.

Walker's Improved Tobacco Cutter.

The accompanying illustration represents a new design of tobacco cutter manufactured by the Erie Specialty Mfg. Company, Erie, Pa. The machine is simple and powerful and can be easily operated. The knife-supporting frame is operated up and down by means of a pinion on the lever and a rack on the frame, the lever having its support on a pin on the back of the plate shown in the engraving, the plate being also utilized for supporting the perpendicular rods which are secured in lugs on the back of it. The knife-supporting frame has three bearings in the proper position to prevent binding, while the ends of the knife work in grooves cut in the rods, permitting the knife to slide up and down and preventing it from springing sidewise. Special attention is directed to the ease with which the knife may be cleaned. The rods being small the knife can be readily reached without removal from the machine, an operation which is necessary in other devices for the same purpose on account of the knife being covered up with a heavy framework. The form of the advertising plate can be made to suit any design required, the lettering of which can be in plain metal type or may be engraved in an artistic manner to represent trade-marks, &c.

Substitute for Binding Twine.—An Iowa inventor is credited with having produced a practicable substitute for binding twine. The new twine is made of hay. He has also invented a machine for making it. When in Chicago a few days since he exhibited a large bundle of such twine, about $\frac{1}{4}$ inch diameter, which is as flexible and as easily handled as the same size of hemp twine, and will bear 200 pounds of tension. This twine may be made of upland prairie grass, though the best is of coarse marsh grass. The machine for making it is simple, and can be constructed so as to be within the reach of every farmer. A boy can make about 800 yards

inventor is organizing a company for its manufacture and for making the machines.

The Cyclone Halter.

The E. Covert Mfg. Company, Farmer Village, N. Y., are making the halter represented in the accompanying cut. The halter is constructed with malleable trimmings, the lightness of which is especially referred to. By the peculiar construction the halter may be adjusted quickly to fit a young colt or a full-grown horse, while it is only necessary to snap a bridle bit to the trimmings to secure a neat driving or riding bridle, thus avoiding the trouble of changing the entire headgear when it is desired to prepare the



The Cyclone Halter.

horse for working or feeding. A snap designed for the purpose alluded to is furnished with the halter. The manufacturers state that only first-class oak-tanned harness leather is used in connection with this combined halter and bridle.

We neglected to state in connection with the publication of the text of the Muller basic patent, that we were indebted to L. G. Laureau, of 60 Washington Square, South, New York, for the information given.

PERSONAL.

Tooke Straker, a well-known furnace manager, has taken charge of the Wharfen Furnace, at Port Oram, N. J.

Phillips & Claghorn, engineers, chemists and assayers, of Birmingham, Ala., have dissolved partnership. Prof. Wm. B. Phillips has purchased Mr. Claghorn's interest in the firm and will hereafter conduct the business on his own account, and R. Claghorn will devote his time exclusively to the coal business and to the Coal City Coal and Coke Company, of Birmingham, of which he is general manager.

A. A. Arthur, general manager of the Middlesborough Town Company, Middlesborough, Ky., has sailed for Europe.

On the 1st inst. William P. Hopkins, for twenty-six years superintendent of the plant of the mills of the Catasauqua Mfg. Company, of Catasauqua, Pa., severed his connection with it. Wm. H. Graham, formerly of Pittsburgh, and for some months in charge of Mill D, at Ferndale, has been appointed superintendent of Mills A and C at Catasauqua, and Edward Edwards, superintendent of Mill B, takes charge of Mills B and D at Ferndale, with R. Sayre Van Dorn, of Catasauqua, as assistant.

Edward V. d'Inwilliers, geologist, of Philadelphia, has sailed for Cuba to visit and report upon certain iron ore properties in the Santiago district. His address until March 1 will be in care of J. M. Borjes & Co., Havana. Upon returning to the United States he will examine coal and iron ore properties in the Birmingham, Ala., district.

Massachusetts Institute of Technology.—The annual report of President Walker of the Massachusetts Institute of Technology, contains a great deal of useful and interesting information relative to the work which is being done at that institution. At present there are in the Institute 909 students, which is an increase of 82 over last year. These are divided by courses as follows: Graduate students for advanced degree, 3; regular students, fourth year, 110; third year, 130; second year, 148; first year, 261; special students, 257. Of the whole number of students attending the Institute, 72 per cent. are regular. The statistics of residence show that 35 States of the Union, with the District of Columbia, as well as Canada, Ireland, Scotland, Peru, Brazil, Guatemala, Turkey, the West Indies, Hawaiian Islands, Bulgaria, Japan, Panama and France, are represented in the list of students. Of the 909 students attending the Institute 533 are from the State of Massachusetts; 114 from other New England States; 262 from outside of New England, of whom 17 are from foreign countries. There are also 33 women in the Institute. Of the specials, 9 are of the chemical and physical course; 9 study biology and allied subjects; 4 mathematics and 1 architecture. The division of the second year students into courses is, civil, 29; mechanical, 29; mining, 9; architectural, 16; chemical, 5; electrical, 43; biological, 4; physics, 1; general, 5; chemical engineering, 3, and sanitary engineering, 6. The number of instructors of all grades, exclusive of those persons announced as lecturers for the year only, but including the instructors at the shops, is 92 as compared with 79 the year previous.

It is reported that American capitalists are about to develop the famous iron mine located on the Orinoco River, about 18 miles from its mouth. This Venezuela ore has been tested in this country, a series of analyses showing that the iron ranges be-

tween 63.94 and 69.65 per cent., the phosphorus between 0.006 and 0.033 per cent., the sulphur between 0.01 and 0.18 per cent. and the silica between 0.5 and 0.7 per cent.

Boston's New Lighthouse.—Boston harbor has a new lighthouse in operation. It is on Deer Island. The lamp was lighted for the first time last Saturday night. The foundation of the structure is a great cylinder of iron, resting in the sand, and securely anchored and protected by some thousands of yards of broken stone that have been dumped around it. This part of the structure is 30 feet in diameter. It swells out, bell-fashion, at the top, where is a wide promenade protected by a hand rail and covered by a roof. Above this rises the tower proper in the form of a truncated cone. There is a gallery around the top of the cone. The light itself is 57 feet above mean sea level. The strength and cheapness of iron and steel make it probable that these metals will be used in future in all lighthouses which like this are exposed to the assaults of the waves. The old-fashioned stone towers are more expensive and less comfortable for the keepers and in no way better than the iron towers.

Collapse in English Shipbuilding Contracts.—The month of January has brought with it a complete change in the tone of the shipbuilding market. So far as can be reliably ascertained there have been hardly any new orders placed in the kingdom since the year came in, and from the opinions that are now obtaining in shipping circles as to the outlook for freights, there appears no prospect of any great accession of contracts for a time to come. The London *Economist* reports that on the Tyne there have been only one or two boats placed, and in Scotland the total new tonnage for the month does not exceed 5000 tons, one of the poorest totals on record. In January, 1889, the new tonnage reached 29,000 tons. Some builders state that they are not having a single inquiry. There is still, of course, a very large quantity of work in hand, some yards having a full year's work booked. Should the price of material come back substantially, it is likely one or more of the large steamship lines will go in for new steamers. Some of the boards have had the question of building under consideration, but have postponed action until values get easier.

At Duluth, on the 8th inst., another whale-shaped boat, the "104," was launched in the presence of a large number of spectators at the American Steam Barge Company's yards. The launch was the most successful one yet. The new boat is 284 feet long, 36 feet beam and 22 feet depth of hold, and will carry 2900 tons on 15 feet of water, and on a full depth, 3300, making her the largest carrier on the lakes. Work is now going on at the yards on the "105," which will be launched in about a month; on the "101," whose capacity will be greatly enlarged, and the "106," which will be a steamer; work will begin at once on the "107."

It is advocated that the type of cutlass now in use in the navy be changed for one of more recent pattern. Among the latest styles, and one which appears to meet considerable favor, is a cutlass fitted with a hollow space in its back. This space is about 15 inches in length, and has a depth sufficient to receive a ball of mercury of the size of a small pea. As a blue-jacket stands upon the rail of a ship or upon any elevation and cuts down at an antagonist the ball of mercury is made to roll toward the point by the

downward blow. It is said that the impetus lent by the little ball of mercury is very great, and permits of a far heavier blow being delivered than with the old blade. The cutlass in question is provided with a guard similar to that fitted to the United States cavalry sabre, and is several inches longer than the old blade. The mountings on the scabbard appear to be solid and substantial.

At Lansing, Mich., on the 8th inst., the creditors of the Capital Wagon Company, recently assigned, held a meeting and instructed the assignee to start up the factory. A reorganization will probably be effected and work continued. The assignee reported assets of \$95,400, with liabilities of \$127,828.

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